ATTIX 751-01/-11/-21
ATTIX 751-2M/-0H
ATTIX 761-21XC/-2MXC
ATTIX 763-21ED/-2MED
ATTIX 791-21/-2M/B1
ATTIX 751-61/-71
ATTIX 19 Gallon/-AE
ATTIX 19 Gallon/AS/PE2

Nilfisk ALTO
Why Compromise

Repair Manual

Wap
KEW
TECHNOLOGIES

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In this manual you will find the essentials you need to know when repairing wet and dry cleaners of the Attix 7 and 19 Gallon series.

When carrying out repairs, make sure you have a suitable workbench or the like with the necessary power supply available.

If you determine an error in operation, be sure to refer the customer to the user manual.

A fault in the equipment can have a number of causes. Chapter E Troubleshooting will help you here.

Use the illustrated spare parts lists for your repairs. These show you the location of the individual parts and the sequence in which they are assembled.

Read the technical information sheets. These will tell you about any technical modifications made after publication of this repair manual.

Technical information sheets are a supplement to the spare parts list until a follow-on publication.

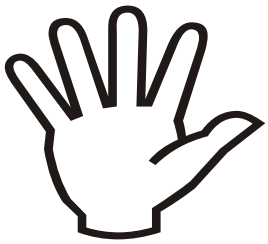
Repair manuals and technical information sheets should be available at the site where repairs are carried out. Further repair manuals of the Attix series may be necessary for repairs to the equipment.

It is not permitted to give them to third parties.

Use original Nilfisk ALTO spare parts only!

Symbols used to mark instructions

Safety instructions marked with this symbol in this manual must be observed to prevent danger to persons.



This symbol is used to mark safety instructions that must be observed to prevent damage to the equipment and degradation of performance.

This symbol indicates tips and instructions to simplify work and to ensure safe operation.

For your own safety

Repairs should only be made by someone who has received proper instructions for the job or who is a qualified electrician.

Observe national safety directives and regulations for the electrical engineering trade, in particular:

IEC 60335-2-69
EN 60335-2-69

DIN VDE 105 part 1:
operation of electrical power installations

DIN VDE 0701/0702:
repair, modification and testing of electrical installations

Before starting the equipment, be sure to read the accompanying service manual, and keep it close as ready reference.

The equipment should only be used by persons who have been instructed in its use and are authorized to do so.

ESD (electrostatic discharge)

Observe the following ESD precautions before any repair of or near electronic parts:

• Touch the protective conductor to discharge your own body.

• Possibly wear an anti-static wrist strap.

• Use a conducting floor or tabletop.

• Never touch a circuit board or electronic components, always hold them by the plastic or insulation.

• Transport electronic parts in conductive packaging (e.g. special ESD packages).

Version / Type	Attix		751-01	751-11					751-21	751-2M	751-0H		761-21 XC			
National Variants			ZA	EU	DK	CH	GB 110V	GB 230V	EU	EU	EU	DK	EU	DK	GB 110V	GB 230V
Electrical data	Voltage	V	230				110		230						110	230
	Frequency	Hz	50/60													
	Fusing	A	16		10		25	13	16			10	16	10	25	13
	Power consumption PIEC	W	1200								1000		1200			
	Connected load for appliance socket	W	-	2400	1100		1550	1800	2400		-		2400	1100	1550	1800
	Total connected load	W	-	3600	2300		2750	3000	3600		-		3600	2300	2750	3000
	Power cord lenght	m	7,5					10	7,5							10
	Power cord type		H05RR-F3G0,75	H05RR-F3G1,5	H05RR-F3G1,0		H07BQ-F 3G2,5	H05RR-F3G1,5			H07RN-F3G1,5	H05RR-F3G1,0	H05RR-F3G1,5	H05RR-F3G1,0	H07BQ-F 3G2,5	H05RR-F3G1,5
Protec-tion	Protection class		II	I							II		I			
	Protection category		IPX4													
	RFI suppression		EN 55014-1													
Dimensions and wight	Width	mm	580													
	Depth	mm	605													
	Hight	mm	970													
	Weight	kg	25										27			
	Tank volume	l	70													
Unit-specific data	Air volume flow (max)	l/min	3600								3100		3600			
	Static wate lift (max)	Pa	23000								20000		23000			
	Sound pressure level at 1m, EN 60704-1	dB(A)	64								60		64			
	Operating noise	dB(A)	57													

Version / Type	Attix		763-21 ED	761-2M XC	763-2M ED	791-21	791-2M/B1			751-61			751-71
National Variants			EU	EU	EU	EU	EU	GB 110V	GB 230V	EU	DK	CH	EU
Electrical data	Voltage	V	230	230	230	230	230	110	230	230			230
	Frequency	Hz	50/60										
	Fusing	A	16					25	13	16	10		16
	Power consumption PIEC	W	1200										
	Connected load for appliance socket	W	2400					1550	1800	650			
	Total connected load	W	3600					2750	3000	1850			
	Power cord lenght	m	7,5						10	7,5			10(FI)
	Power cord type		H05RR-F3G1,5				H07RN-F3G1,5	H07BQ-F 3G2,5	H05RR-F3G1,5	H05RR-F3G1,0			H07RN-F3G1,5
Protec-tion	Protection class		I										
	Protection category		IPX4										
	RFI suppression		EN 55014-1										
Dimensions and wight	Width	mm	580										480
	Depth	mm	605										510
	Hight	mm	1284	970	1280	970							875
	Weight	kg	17	27	17	25				33			31
	Tank volume	l	30	70	30	70							
Unit-specific data	Air volume flow (max)	l/min	3600										
	Static wate lift (max)	Pa	23000										
	Sound pressure level at 1m, EN 60704-1	dB(A)	64										
	Operating noise	dB(A)	57										

Version / Type	Attix		19 Gallon	19 Gallon-AE	19 Gallon-AS/PE2
Electrical Data	Voltage	V	120		
	Frequency	Hz	60		
	Fusing	A	15		
	Power consumption	HP	1,4	1,1	1,4
	Connected load for appliance socket	HP	0,5	0,8	0,5
	Total connected load	HP	1,9		
	Power cord lengt	ft	25	35	25
	Power cord type		SJTW-A AWG14/3	SJTW-A AWG14/3	SJTW-A AWG14/3
Protection	Protection class		I		
	Protection category		IPX4		
	RFI suppression		EN 55014-1		
Dimensions and weight	Width	in	23		
	Depth	in	24		
	Height	in	38		
	Weight	ib	55	73	60
	Tank volume	gal	19		
Unit-specific data	Volume flow (air)	cfm	127		
	Static water lift	in	93		
	Sound pressure level at 1m EN 60704-1	dB(A)	64		
	Operating noise	dB(A)	57		

Technical data

1 Trolley with container and adapter ring

1) Base frame
2) Adapter ring
3) Container
4) Belt

2 Cleaner heads

Attix 751-01,-0H

Attix 751-11/-21, Attix 19 Gallon
Attix 761-21XC
Attix 791-21

Attix 751-2M
Attix 761-2MXC
Attix 763-2MED

Attix 19 Gallon/AS/PE2XC

Attix 791-2M/B1

Attix 751-61/-71
Attix 19 Gallon AE

3 Filter cleaning

All units with automatic filter cleaning.

Filter cleaning with the Attix 7 is the same as for the Attix 560-XC (see repair manual Attix 550/560, section “Components” page 13).

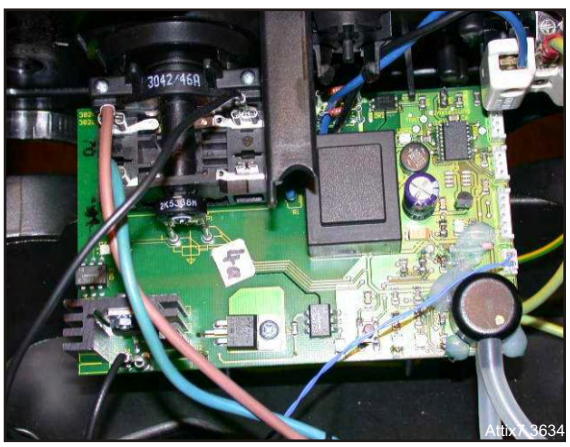
4 Suction turbines

Attix 751-01/-11/-21/-2M/-0H/-61/-71
Attix 19 Gallon/-AE

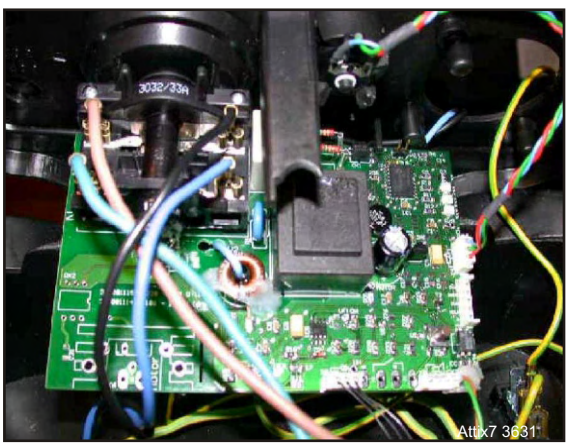
Attix 761-21XC/-2MXC
Attix 763-2M ED
Attix 19 Gallon/AS/PE2XC

Attix 791-21
Attix 791-2M/B1

5 Electrical components



Electronic level control
Attix 751-61/71



Electronic flow metering EC
Attix 791-2M/B1

The following Attix 7 models are fitted with the same electronic circuitry used in other units:

Attix	Electronic soft start	Electronic EA	Electronic flow metering	Electronic magnet contol	Electronically identical to Attix	See section "Components" in repair manual
751-01/-11 19 Gallon	X				550-01, 12 Gallon	Attix 550/560 page 14
751-21		X			550-21, 12 Gallon RDF	Attix 550/560 page 14
751-2M			X		550-2M/-2H	Attix 550/560 page 14
751-0H			X		550-0H	Attix 550/560 page 14
761-21XC, 763-21ED, 19Gallon/AS/PE				X	560-21XC, 12 Gallon RDFD	Attix 550/560 page 14
761-2M/XC, 763-2M/ED				X	560-2MXC/-2HXC	Attix 550/560 page 14
791-21		X			590-21, 12 Gallon EC	Attix 590-21 page 8

GFCI circuit-breaker
Attix 19 Gallon-AE

PRCD circuit-breaker
Attix 751-71

Submersible pump
Attix 751-61/-71
Attix 19 Gallon AE

The following Attix 7 functions are identical to other models:

	Attix	761-21XC/-2MXC 763-21ED/-2MED 19 Gallon AS/PE2	791-21 /-2M/B1	791-21 /-2M/B1	791-21	Function identical to Attix	see section "Operation" in repair manual
1	Function of automatic filter cleaning system	X				560-21/-2M/-2H, 12 Gallon RDFD	Attix 550/560
2	Function of EC.drive		X			590-21, 12 Gallon EC	Attix 590-21
3	Technical description of electronic EC-3			X		590-21, 12 Gallon EC	Attix 590-21
4	Technical description of electronic EA. EC-3				X	590-21, 12 Gallon EC	Attix 590-21

5 Electronic flow sensor EC (Attix 791-2M/B1)

Alto no.: 302001710
(200–230 Vac/50–60 Hz)

Alto no.: 302001709
(100–120 Vac/50–60 Hz)

Several functions are integrated on this circuit board:

- Main switch Man - 0 - Auto ‘
- Speed control
- Remote control of EC drive
- Soft start
- Automatic starter for electrical tools
- Flow detection by flow-sensor
- Setting of different hose diameters

LED functions:
Green LED flashes:
unit on standby

Green LED on:
flow > 22 m/s

Yellow LED on:
flow > 20 m/s and < 22 m/s

Red LED on:
flow < 20 m/s plus buzzer sounds

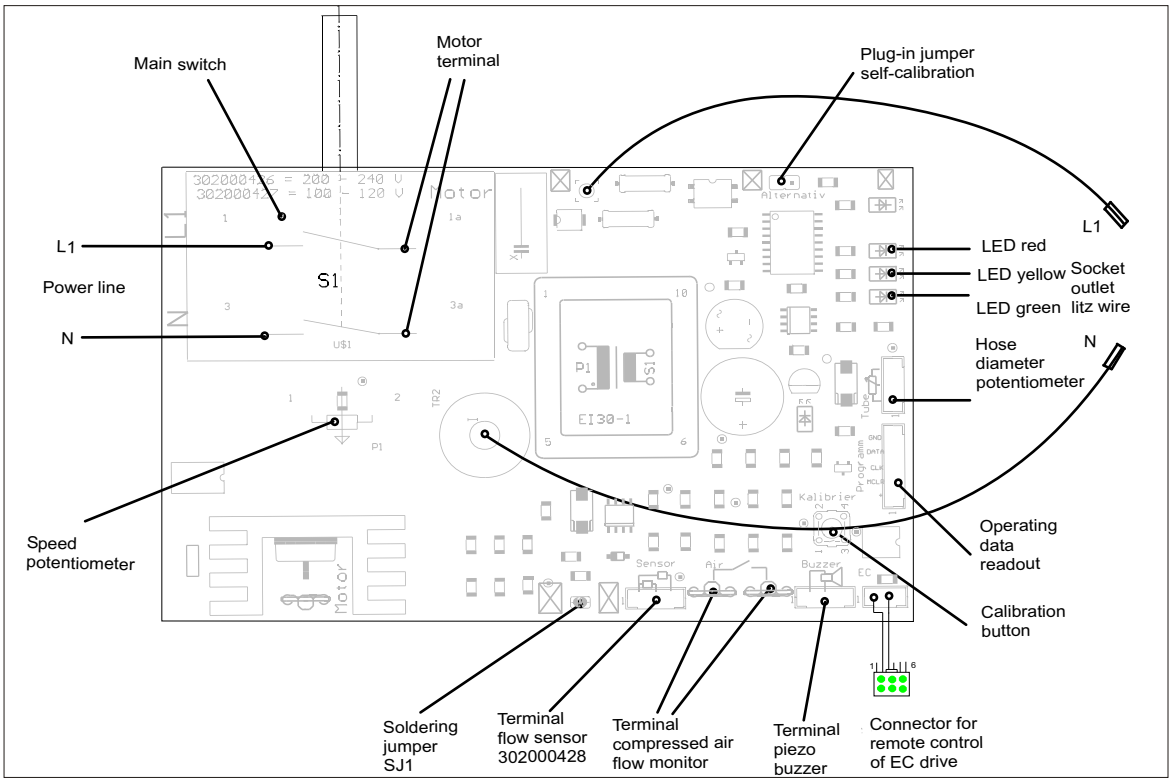
Main switch, speed control, automatic starter:
as described in Attix 550/560 repair manual section D.

Soft start:
the motor always makes a soft start.

Operating data:
saved operating data can be read out on the Alto terminal (no. 301 000 383 for operating data retrieval).

Flow sensor:
as described in Attix 550/560 repair manual, section D.

6 Layout of electronic flow sensor EC (Attix 791-2M/B1)



The following Attix 7 functions are identical to other models:

	Attix	751-01/-11 19 Gallon	751-21	751-0H	751-2M	761-21XC 763-21ED 19 Gal./AS/PE2	761-2MXC 763-2MED	Function identical to Attix	See section "Operation" in repair manual
7	Technical description of electronic softstart	X						550-01 12 Gallon	Attix 550/560
8	Technical description of electronic automatic starter.		X					550-21 12 Gal.RDF	Attix 550/560
9	Technical description of electronic flow measurment			X				550-0H	Attix 550/560
10	Technical description of electronic flow measurment				X			550-2M/-2H	Attix 550/560
11	Technical description of electronic magnet control					X		550-21 12 Gal.RDFD	Attix 550/560
12	Technical description of electronic flow measurement XC						X	560-2MXC/-2HXC	Attix 550/560

13 Turbine / temperature monitoring (Attix 751-61/-71,19 Gallon AE)

A sensor in the exhaust air duct (like flow sensor) measures the temperature of the air from the turbine. If the turbine reaches a temperature of more than 85°C, motor speed is reduced.

14 Electronic level control (Attix 751-61/-71, 19 Gallon AE)

Alto no.: 302001712
(200–230 Vac/50–60 Hz)

Alto no.: 302001711
(100–120 Vac/50–60 Hz)

Several functions are integrated on this circuit board:
- Main switch Pump - Auto - 0 - Man
- Speed control in manu al
- Soft start
- Level control
- Turbine temperature-monitoring

Main switch:
this allows selection of three modes.

Pump:
momentary contact for emptying the container. One-time operation causes the pump to run for 30 s.

Man:
the turbine immediately starts.

Auto:
the turbine and pump are controlled as a function of the level.

Speed control:
the integrated speed control only works in Man mode. The control range is 90° to 130°.

Advantages:
- Optimal matching of suction capacity to the application
- Prolonged turbine service life
- Reduced noise emission
- Power savings

LED functions:
Green LED (D2) on:
operating voltage applied

Green LED (D6) on:
pump on

Green LED (D7) on:
motor on

Red LED (D3) flashes:
microprocessor working

Red LED (D5) on:
level - turn off motor

Yellow LED (D4) on:
level - turn on pump

Operating data:
saved operating data can be read out on the Alto terminal (no. 301 000 383 for operating data retrieval).

Continued on page 20

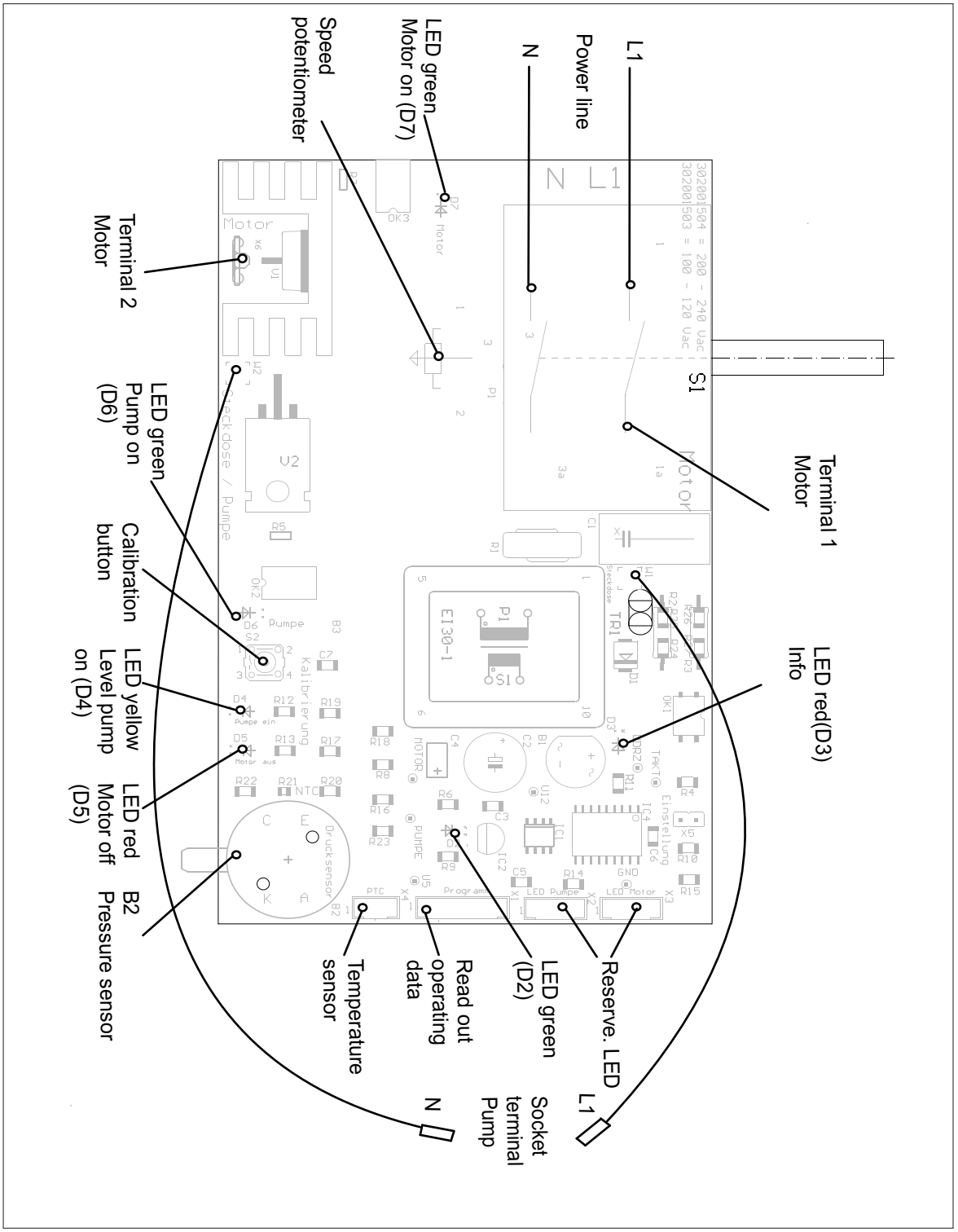
Level control:
Level control by means of a pressure sensor is implemented to optimize working with the equipment. The level in the container is metered in a rubber baffle pipe.The pressure sensor measures the difference in pressure between the container and the baffle pipe. Rising water level increases the pressure in the pipe. The pressure in the baffle pipe increases linearly with water level.

Man mode:
The electronic circuitry cuts out the turbine upwards of a defined pressure (water level), and remains in this status until the cleaner is turned off and the container emptied. The pump cannot be started in manual mode. The power of the turbine can be altered by speed control.

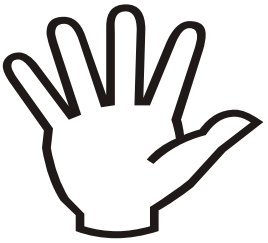
Auto mode:
Only the suction turbine runs when there is no water in the container. When the container fills with water, the pump is turned on. If more water flows into the container than the pump can convey out of the container, the level continues to rise. To prevent overfilling, the suction turbine is cut out at maximum level. As soon as the water level is significantly reduced by the pump, the suction motor is cut in again. Upon total emptying of the container, the pump is cut out with a time delay.

Pump mode:
The Pump switch setting is a momentary contact (automatic reset). One-time actuation causes the pump to work for 30 s. This function can be used to completely empty the container. At the same time this is a safeguard against the pump running when it is dry.

15 **Layout of electronic level control** (Attix 751-61/-71, Attix 19 Gallon AE)



1 ESD (electrostatic discharge)

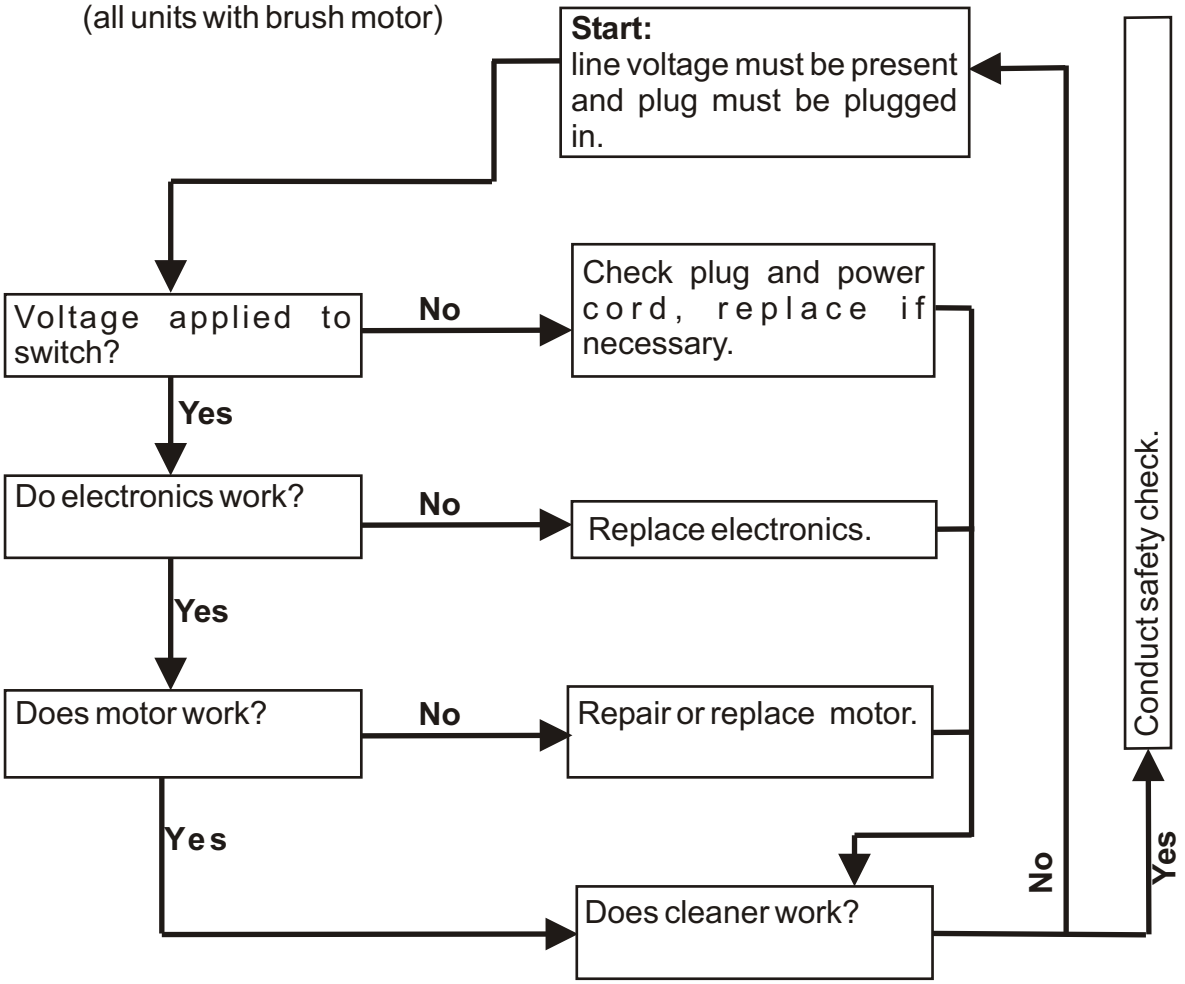


Observe the following ESD precautions before any repairs to electronic circuitry:

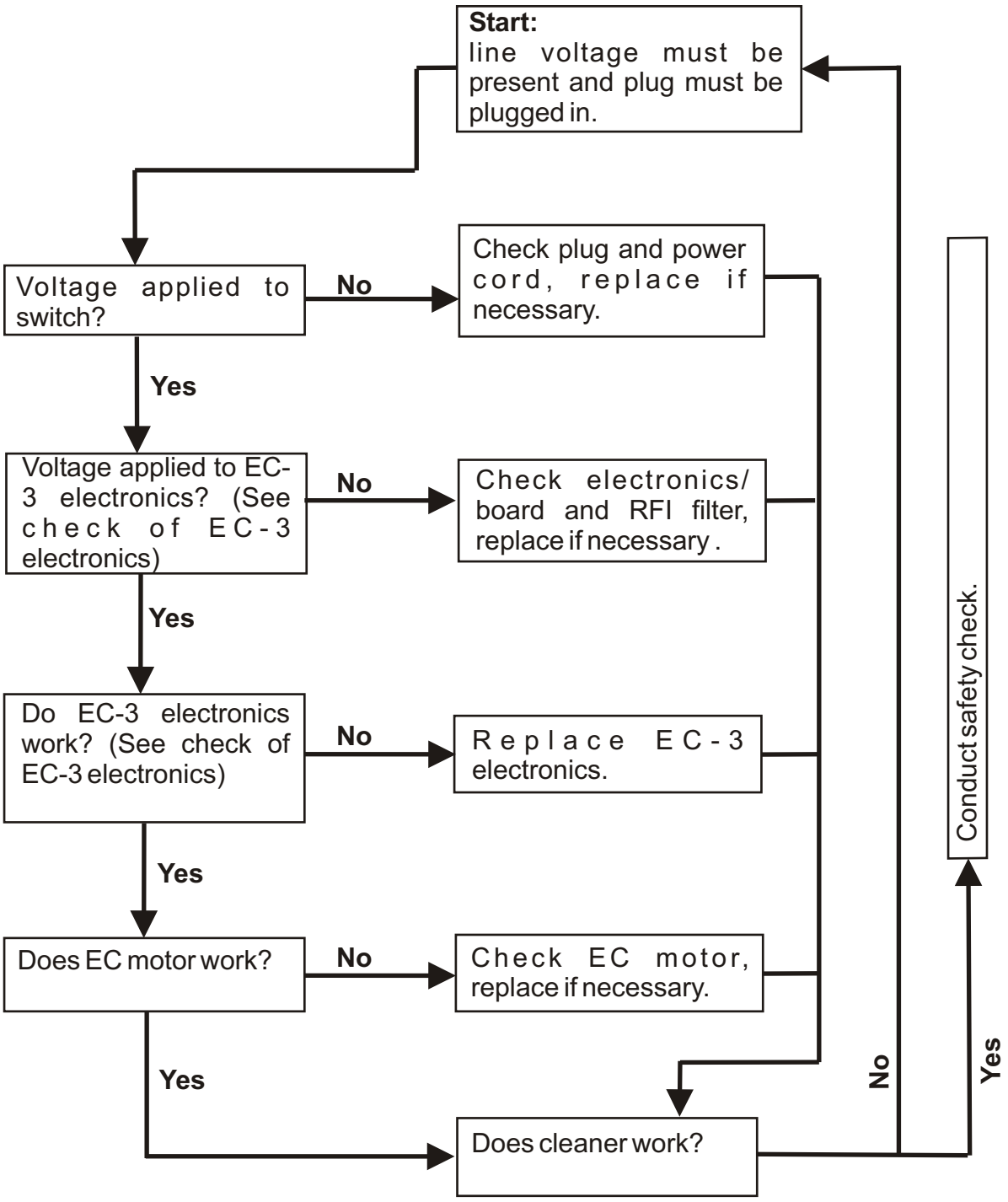
- Touch the protective con ductor to discharge sta tic from your own body.
- Possibly wear an anti-static wrist strap.
- Use a conductive floor-tabletop.
- Never touch a circuit board or electronic com ponents, always hold them by the plastic or in sulation.
- Transport electronic parts in conductive pa ckaging (e.g. Special ESD packages).

2 Troubleshooting on unit

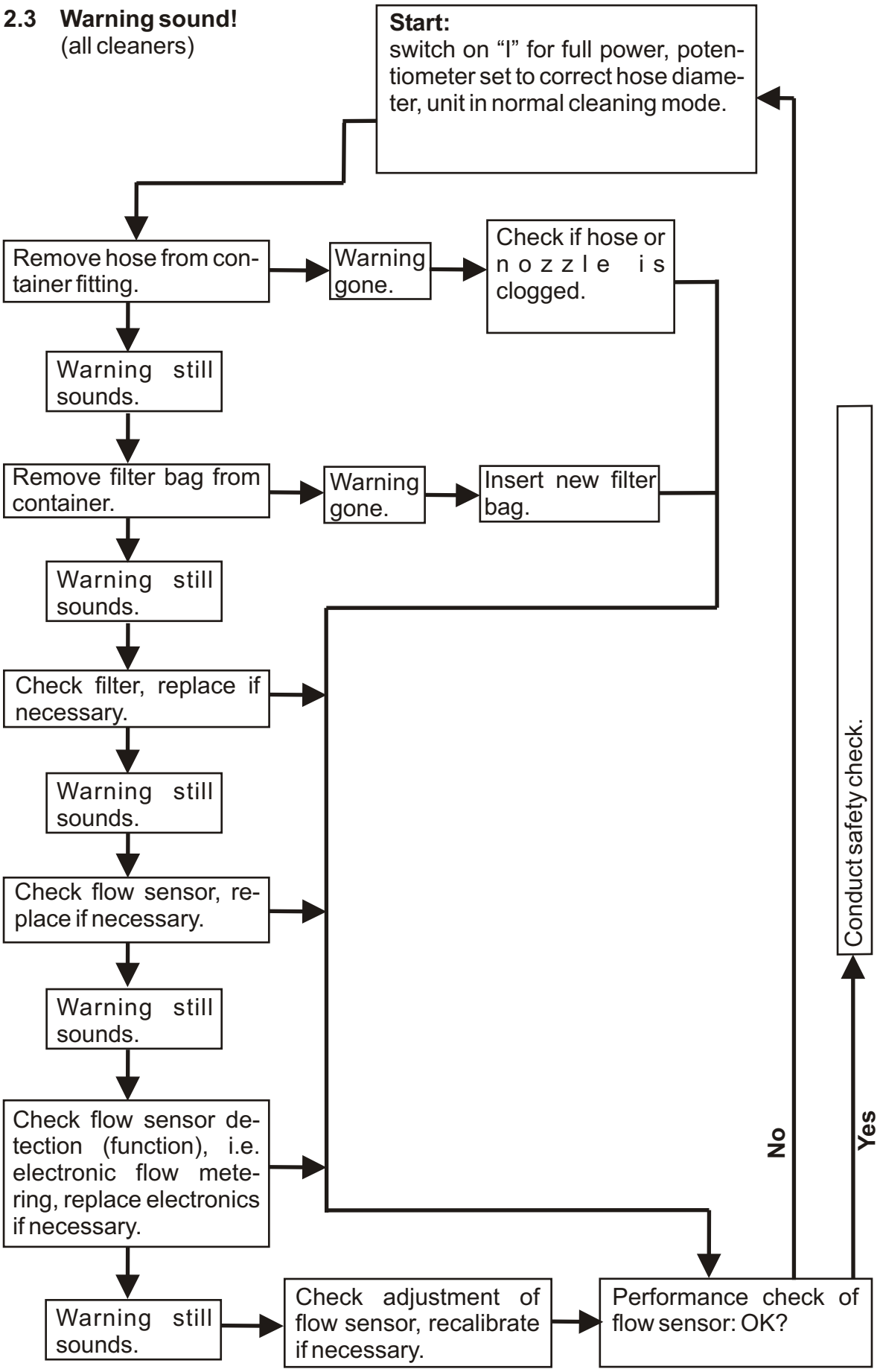
2.1 Unit will not work
(all units with brush motor)



2.2 **Unit will not work** (all units with EC drive)

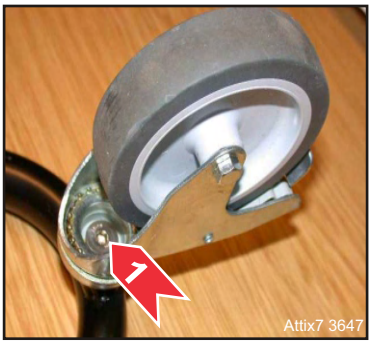


2.3 Warning sound!
(all cleaners)


Start:
switch on “I” for full power, potentiometer set to correct hose diameter, unit in normal cleaning mode.
Remove hose from container fitting.
Warning gone.
Check if hose or nozzle is clogged.
Warning still sounds.
Remove filter bag from container.
Warning gone.
Insert new filter bag.
Warning still sounds.
Check filter, replace if necessary.
Warning still sounds.
Check flow sensor, replace if necessary.
Warning still sounds.
Check flow sensor detection (function), i.e. electronic flow metering, replace electronics if necessary.
Warning still sounds.
Check adjustment of flow sensor, recalibrate if necessary.
Performance check of flow sensor: OK?
No
Yes
Conduct safety check.

3 Trolley/container

3.1 **Removing/fitting castors** (all models except Attix 751-71)



1. Use an Allen key (5 mm) to undo the countersunk head screw (1), and remove the castor.

2. Fit in the reverse order.

3.2 **Removing/fitting wheels** (all models except Attix 751-71)

1. Lever off the wheel cap (1) with a screwdriver, and remove the wheel.

2. Fit in the reverse order.

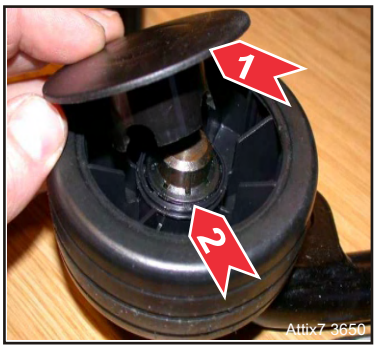
3.3 **Removing/fitting feet** (Attix 751-71)

1. Take the container out of the base frame, and raise the frame by laying the handle on the floor.

2. Unscrew the nut (1), and remove the foot with the screw.

3. Fit in the reverse order.

3.4 **Removing/fitting wheels** (Attix 751-71)



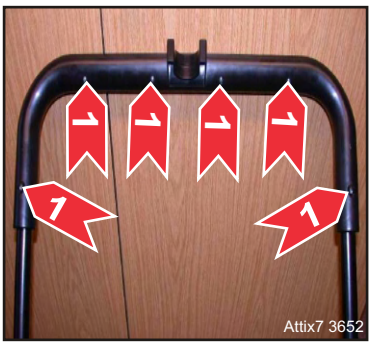
1. Lever off the wheel cap (1) with a screwdriver.

2. Lever the clamping ring (2) off the axle with a screwdriver, and remove the wheel.

3. Fit in the reverse order.

Do not push the clamping ring too far onto the axle otherwise the wheel will not turn freely.

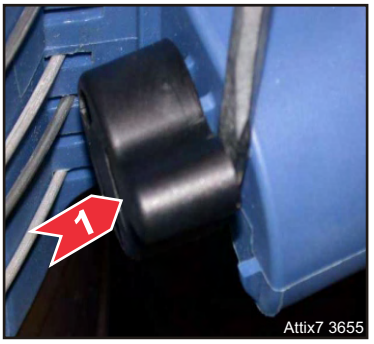
3.5 **Removing/fitting grips** (all models except Attix 751-71)



1. Undo the six screws (1) with a Phillips screwdriver, and remove the grips.

2. Fit in the reverse order.

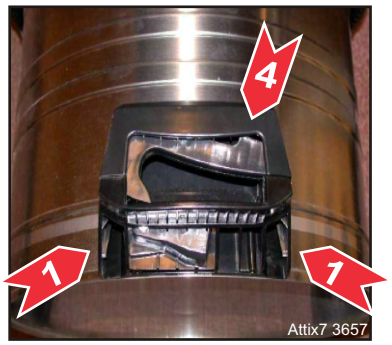
3.6 **Removing/fitting lock** (all models)



1. Lever off the lock (1) with a screwdriver.

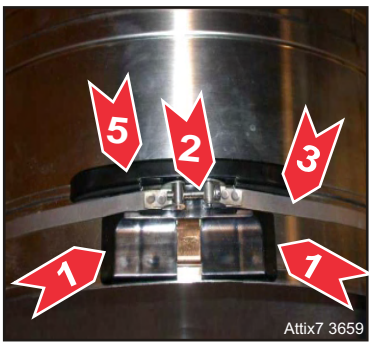
2. Fit in the reverse order, pressing the lock (1) firmly over the latch so that you hear it snap into place.

3.7 **Removing/fitting grip with tensioning band** (all models)



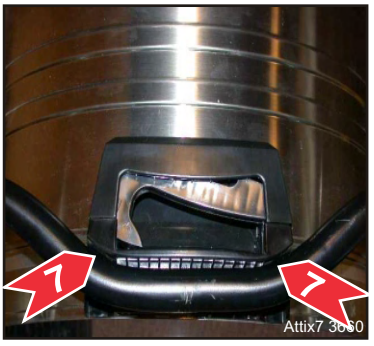
1. Take the cleaner head with the adapter ring off the container, and lift the container out of the base frame.

2. Mark (1) the position of the grip (4) and the facing stop (5) on the container.



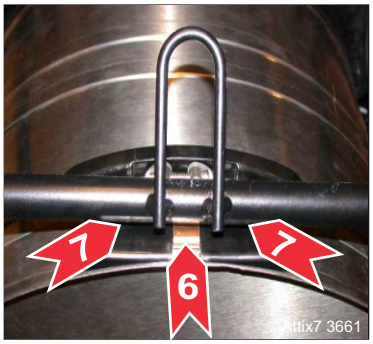
3. Undo the screw (2) on the tensioning band (3) with a screwdriver, and remove the grip (4) and tensioning band (3).

4. Fit in the reverse order, placing the grip (4) and stop (5) between the markings and lightly tightening the screw (2) on the tensioning band (3).



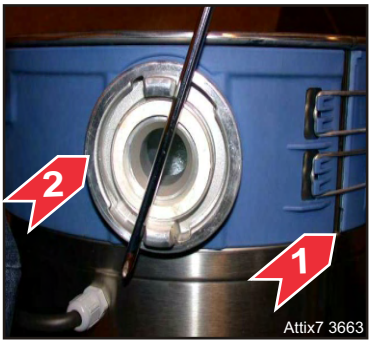
5. Set the container in the base frame, and lock it in place.

6. Align the grip (4) and stop (5) on the container in the base frame (7), and firmly tighten the screw (2) on the tensioning band (3).



Note:
The contact faces of the contact spring (6) must be clean and free of corrosion.

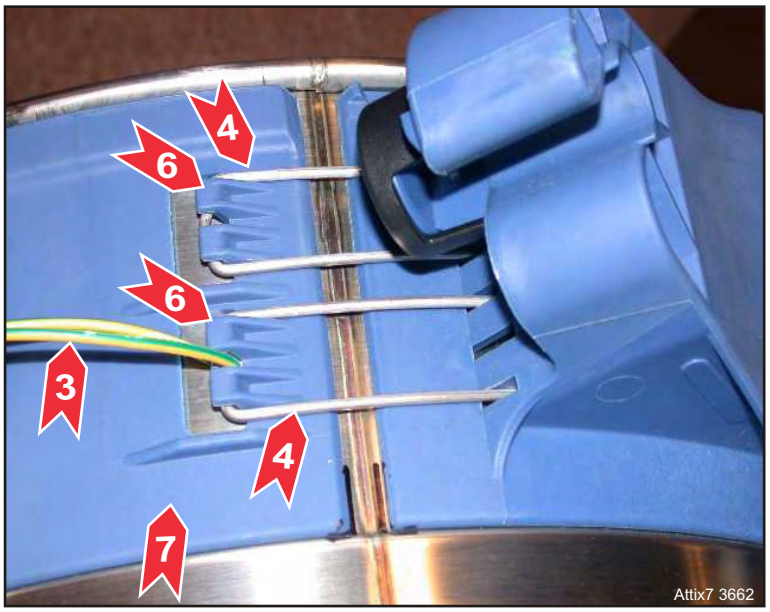
3.8 **Removing/fitting belt** (all models)



1. Take the cleaner head with the adapter ring off the container, and lift the container out of the base frame.

2. Mark the position of the belt on the container (1).

3. Take out the C-coupling (2) with a long screwdriver (only cleaners used by fire brigades).

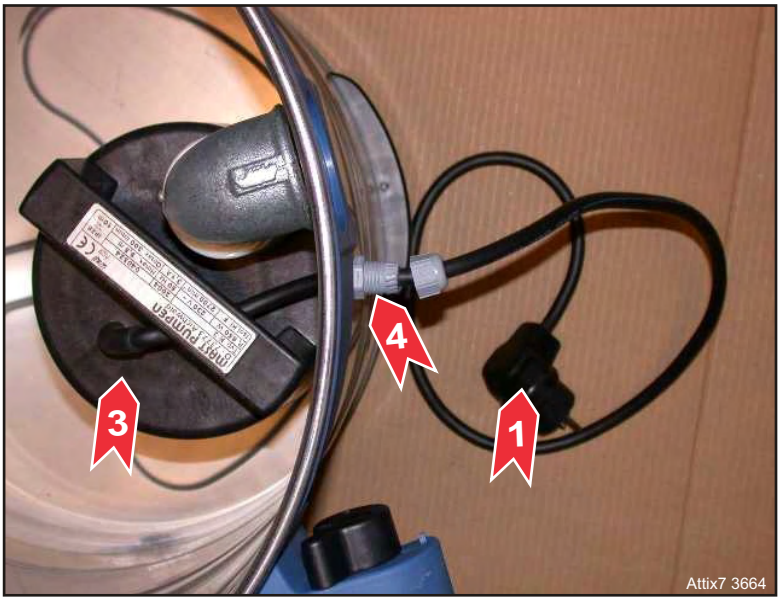


4. Thread a normal length of cord (3) or the like (60-80 cm) through one of the loops (4) of the tensioning device, and pull the loop (4) back over the catch (6). Detach the second loop (4) in the same way, and take off the belt (7).

5. Fit in the reverse order, making sure the belt (7) is correctly positioned.

Note:
On cleaners used by fire brigades, always fit the C-coupling (2) first as a positioning aid.

3.9 **Removing/fitting pump** (Attix 751-61/-71, Attix 19 Gallon AE)



1. Take the cleaner head with the adapter ring off the container, and lift the container out of the base frame..

2. Take out the C-coupling (see 3.8/3, page 27).

3. Disassemble the plug (1) of the pump (3), undo the cable fixture (4) on the container, pull the cable through, and take out the pump.

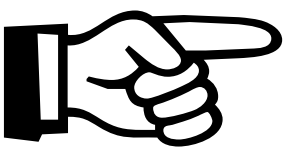
Fit in the reverse order.

3.10 **Removing/fitting non-return pipe** (Attix 751-61/-71, Attix 19 Gallon AE)

1. Remove the pump (1) (see 3.9, page 28).

2. Unscrew the non-return pipe (2) from the threaded fitting of the pump (1), and remove it.

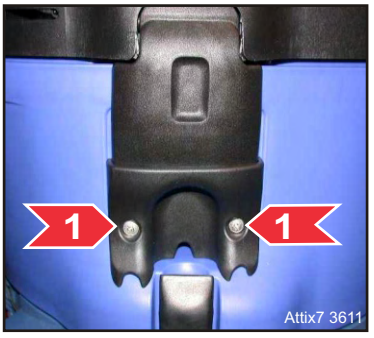
3. Fit in the reverse order.



Note:
The threaded fitting can be sealed with normal silicone.

4. Cleaner head

4.1 Removing/fitting grip (Attix 751-61/-71,19 Gallon AE)



As explained in the Attix 550/560 repair manual, section E, page 36. But first unscrew the clamping fixtures right and left (1).

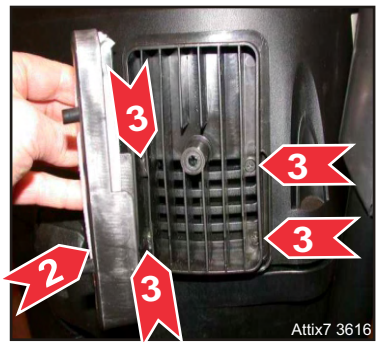
The following repairs are identical as with other models.

	Attix	751-01/-11/-21 751-2M/-0H 791-21/-2M/B1 19 Gallon	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	Identical to Attix	See section "Troubleshooting" in repair manual
4.2	Removing / fitting grip	X		550-01 12 Gallon	Attix 550/560 page 36
4.3	Removing / fitting grip		X	560-21 12 Gal.RDFD	Attix 550/560 page 37

	Attix	751-01/-11/-21 751-2M/-0H 791-21/-2M/B1 19 Gallon-AE 751-61/-71	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	Identical to Attix	See section "Troubleshooting" in repair manual
4.4	Removing / fitting hood	X		550-01 12 Gallon	Attix 550/560 page 36
4.5	Removing / fitting hood		X	560-21 12 Gal.RDFD	Attix 550/560 page 37

4.6 Removing/fitting cooling air filter (Attix 791-2M/B1)

1. Undo the screw (1) with an Allen key (5 mm), and take off the cover.

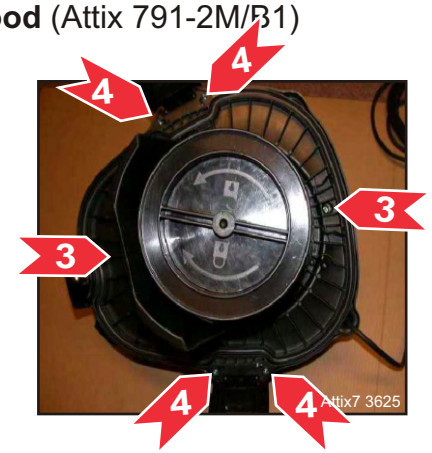


2. Pull off the filter insert (2) forwards.

3. Undo the four screws (3) with a Phillips screwdriver, and take off the filter case.

4. Fit in the reverse order.

4.7 Removing/fitting hood (Attix 791-2M/B1)



1. Unscrew the cooling air filter (see 4.6).

2. Unscrew the socket (see 7.4).

3. Undo the two screws (3) with an Allen key (5 mm), and take off the grip.

4. Undo the four screws (4) of the locking clamps with a Phillips screwdriver, and take off the hood.

5. Fit in the reverse order.

The following repairs are identical as with other models.

	Attix	All models except 791-21/-2M/B1	791-21	Identical to Attix	See section "Troubleshooting" in repair manual
4.8	Removing / fitting locking clamps	X		550-01 560-21 12 Gallon/-RDFD	Attix 550/560 page 45
4.9	Removing / fitting locking clamps		X	590-21	Attix 590-21 page 18

4.10 Removing/fitting locking clamps (Attix 791-2M/B1)

1. Remove the hood (see 4.7).

2. Take off the clamping plate (see Attix 590-21EC repair manual, section E).

3. Pull the locking clamps upwards and off.

4. Fit in the reverse order.

5. Suction turbine

The following repairs are identical as with other models.

	Attix	751-01/-11/-21 751-2M/-0H 19 Gallon-AE 751-61/-71	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	791-21	Identical to Attix	See section "Troubleshooting" in repair manual
5.1	**Removing / fitting clamping plate**	X			550-01 12 Gal./-RDFD	Attix 550/560 page 38
5.2	**Removing / fitting clamping plate**		X		560-21 12 Gal./-RDFD	Attix 550/560 page 39
5.3	**Removing / fitting clamping plate**			X	590-21	Attix 590-21 page 18

5.4 Removing / fitting clamping plate (Attix 791-2M/B1).

1. Remove the hood (see 4.7).

2. Remove the clamping plate (see Attix 590-21EC repair manual, section E).

3. Fit in the reverse order.

The following repairs are identical as with other models.

	Attix	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2 751-61/-71 19 Gallon AE	Identical to Attix	See section "Troubleshooting" in repair manual
5.5	**Removing / fitting bracket for filter tightener**	X		560-21 12 Gal./-RDFD	Attix 550/560 page 40
5.6	**Removing / fitting hose for level monotoring**		X	560-21 12 Gal./- RDFD	Attix 550/560 page 40

The following repairs are identical as with other models.

	Attix	All models except those with EC-drive	791-21/-2M/B1	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	Identical to Attix	See section "Troubleshooting" in repair manual
5.7	Removing / fitting motor carbon brushes	X			560-21 12 Gallon/- RDFD	Attix 550/560 page 41
5.8	Removing / fitting motor	X			560-21 12 Gallon/- RDFD	Attix 550/560 page 41
5.9	Checking motor, removing / fitting motor		X		590-21EC	Attix 590-21 page 19-20
6	Automatic filter cleaning			X	560-21 12 Gallon/- RDFD	Attix 550/560 page 42-44

7 Electrical

Following repairs or servicing, perform a thorough electrical check.
Caution!
Make sure the power plug is pulled out while you are carrying out repairs.

7.1 Removing / fitting electrical components

Caution!
Work with the appropriate wiring diagram (see section H). It is helpful if you make a sketch to clearly show which cable (note the color) matches which terminal.

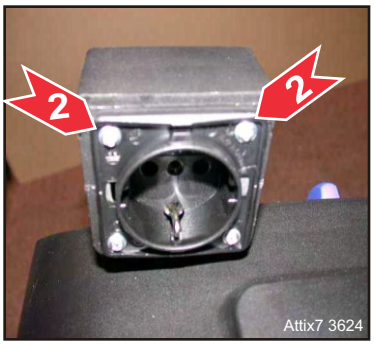
The following repairs are identical as with other models.

	Attix	751-01/-11/-21 751-2M/-0H 19 Gallon/-AE 751-61/-71 791-21	761-21XC 761-2MXC 763-21ED 763-2MED 19 Gal./AS/PE2	Identical to Attix	See section "Troubleshooting" in repair manual
7.2	Removing / fitting power cord	X		550-01 12 Gallon/- RDF	Attix 550/560 page 45
7.3	Removing / fitting power cord		X	560-21 12 Gallon/- RDFD	Attix 550/560 page 45

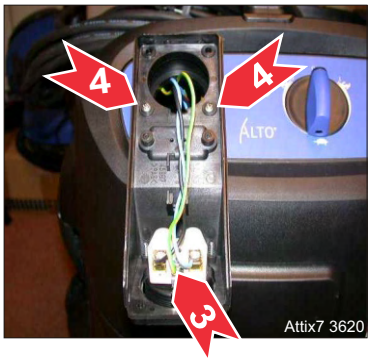
7.4 Removing/fitting socket

Attix 791-2M/B1

1. Use a screwdriver to take off the cover frame (1).



2. Undo the six screws (2) holding the cover with a Phillips screwdriver, and take off the cover.



3. Disconnect the cable on the socket (3), undo the two screws (4) with a Phillips screwdriver, and take off the case.

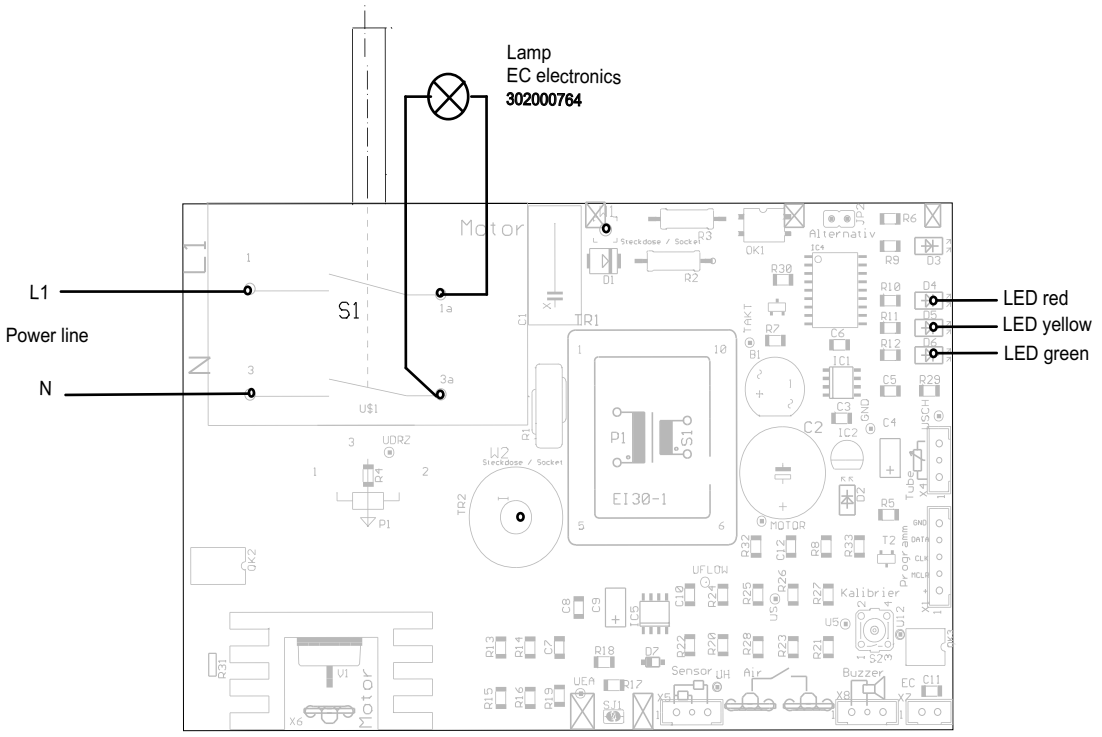
4. Fit in the reverse order.

7.5 Removing/fitting power cord (Attix 791-2M/B1)

1. Remove the hood (see 4.7).

2. Remove the power cord (see Attix 590-21EC repair manual, section E, page 21).

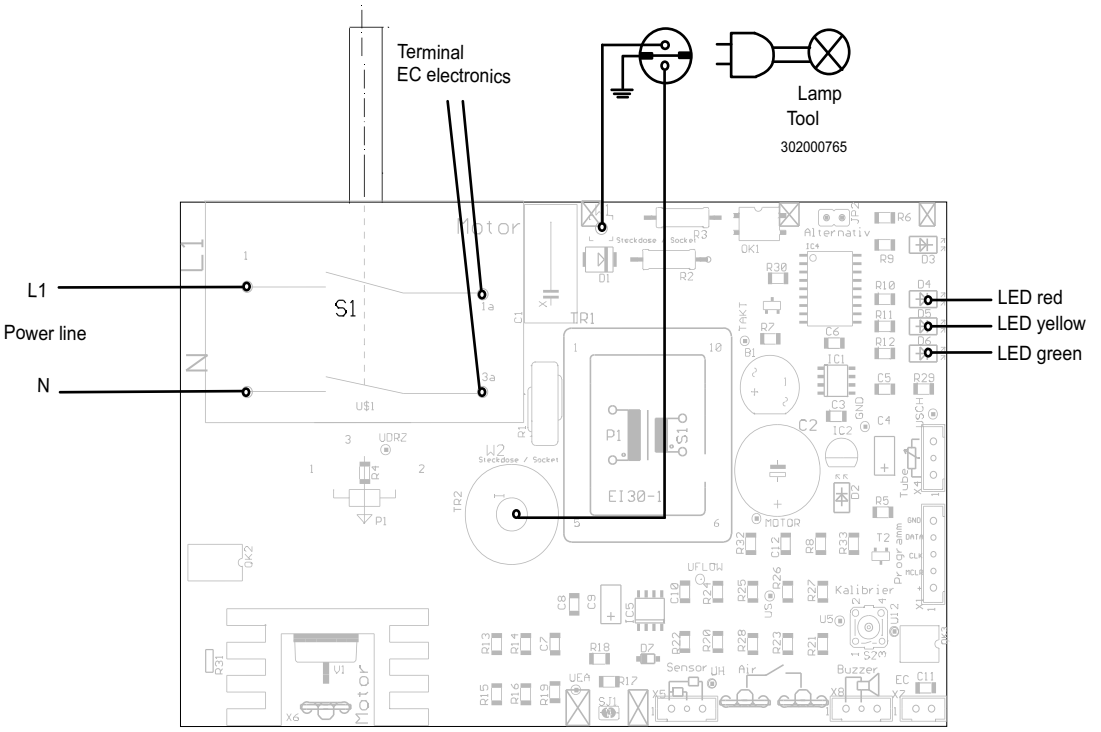
7.6 Checking electronic flow metering EC in manual mode
(Attix 791-2M/B1)



1. Make sure the unit is isolated from the power.
2. Remove the hood (see 4.4).
3. Set the cleaner head on a clean container (w/o a filter bag) and withdraw the hose from the container fitting.
4. Apply line voltage and set the switch to “I”.
   Visual check:
   Green LED on = EC electronics driven, air flow OK.
   Yellow LED on = EC electronics driven, air flow reduced.
   Red LED on = EC electronics driven, air flow too low.
5. Make sure the unit is isolated from the power.
6. Withdraw the two cables for the EC electronics on the switch and connect the lamp 302000764.
7. Apply line voltage and set the switch to “I”.
   Check:
   Lamp “EC electronics” illuminates immediately.
   Red LED illuminates and warning sounds.

“MAN” OK?
- Ja - “MAN” mode OK.
- No -replace electronic and recalibrate

7.7 Checking electronic flow metering EC in automatic mode (Attix 791-2M/B1)



1. Make sure the unit is isolated from the power.
2. Remove the hood (see 4.4).
3. Set the cleaner head on a clean container (w/o a filter bag) and withdraw the hose from the container fitting.
4. Insert the “tool” lamp in the socket (302000765) and rotate the bulb one turn out of the receptacle.
5. Apply line voltage and set the switch to “Auto”.
6. Visual check:
   Green LED flashes (standby).
7. Check:
   Turn the bulb properly into the receptacle. The “tool” lamp illuminates immediately, and the motor starts.
   The red, yellow and green LEDs illuminate.
   The red and yellow LEDs extinguish after 3-5 s.
   Rotate the bulb one turn out of the receptacle.
   The motor stops (runs on) after 3-5 s.

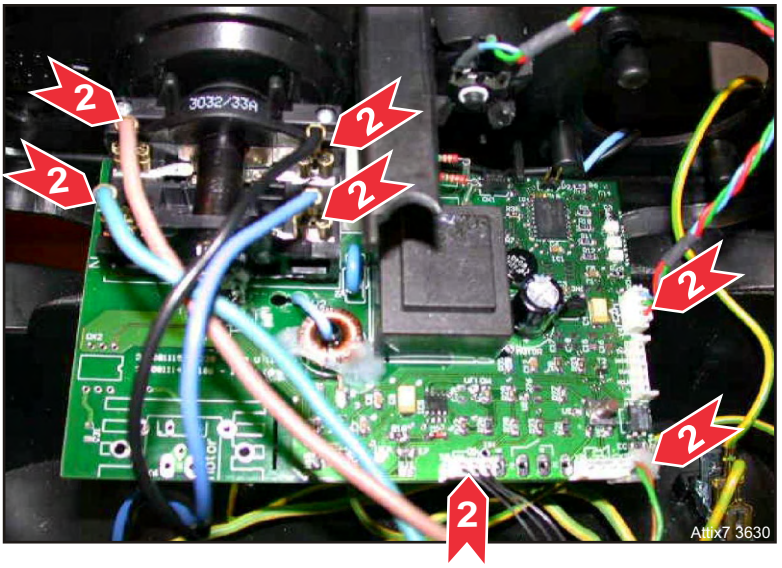
“Auto” Mode OK?

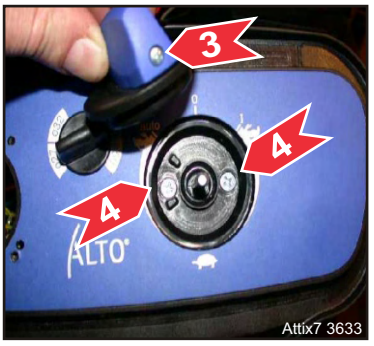
- Yes - “Auto” Mode OK.
- No - Replace electronic and recalibrate

The following repairs are identical as with other models.

	Attix	751-2M/-0H 761-2MXC 763-2MED1 791-2M/B1	Identical to Attix	See section "Troubleshooting" in repair manual
7.8	Checking flow sensor detection (performance) of electronic flow metering	X	550-2M/-0H	Attix 550/560 page 54
7.9	Checking and calibration (adjustment) of flow sensor	X	550-2M/-0H	Attix 550/560 page 55-56

7.10 Removing/fitting electronic flow metering EC (Attix 791-2M/B1)





1. Remove the hood (see 4.7).

2. Disconnect the power cord, cables to EC electronics, flow sensor, buzzer, and potentiometer from the electronics. Disconnect L1 and N on the socket (2).

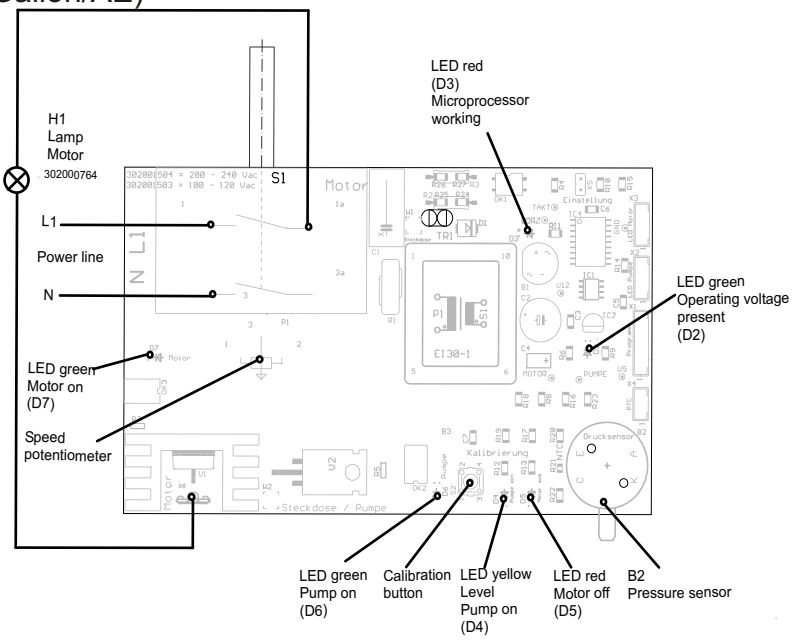
Withdraw the plug for the speed control from the EC electronics.

3. Undo the retaining screw (3) on the rotary knob with a Phillips screwdriver, and remove the rotary knob.

4. Undo the two retaining screws (4) behind the rotary knob with a Phillips screwdriver, and remove the electronics.

5. Fit in the reverse order.

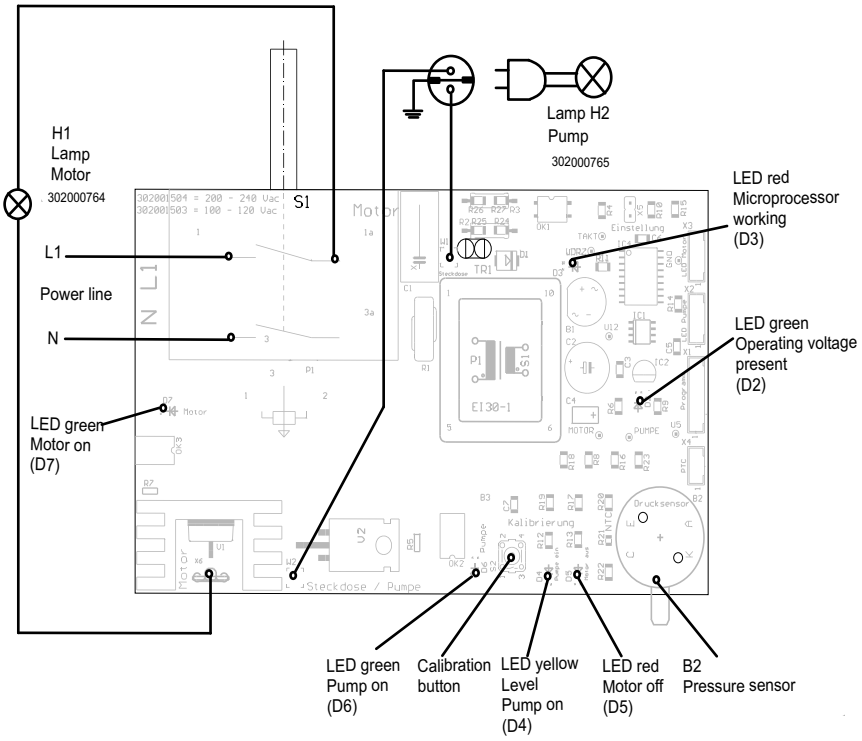
7.11 Checking electronic level control in manual mode
(Attix 751-61/-71, 19 Gallon/AE)



1. Make sure the unit is isolated from the power supply.
2. Remove the hood (see 4.4, page 31).
3. Place the cleaner head on a table so that the hose hangs downwards.
4. Remove the two motor cables from the board and the switch.
5. Connect the test lamp 302000764.
6. Apply line voltage and set the switch to “I” (Man) for full power.
   Visual check:
   Green LEDs (D2 and D7) illuminate.
   Red LED (D3) flashes (microprocessor working).
   Check soft start and speed control:
   The motor lamp slowly starts to illuminate (soft start).
   Set the switch to minimum speed.
   The brightness of the lamp reduces.
   Check level control:
   Mark the hose at 11 cm.
   Slowly immerse the hose in a container filled with water until the lamp extinguishes. This turn-off point should be at the marking 11 cm ±1 cm (recalibrate the level control if necessary (see 7.) and repeat the procedure).
   Green LED (D2) illuminates, red LED (D3) flashes.
   Red LED (D5) illuminates.
7. The system can be activated again after a reset.

“Manual” OK?
- Yes - “MAN” Mode OK.
- No - Replace electronic and recalibrate level

7.12 Checking electronic level control in automatic mode
(Attix 751-61/-71, 19 Gallon/AE)



1. Make sure the unit is isolated from the power supply.
2. Remove the hood (see 4.4, page 30).
3. Place the cleaner head on a table so that the hose hangs downwards.
4. Remove the two motor cables from the board and the switch.
5. Connect the test lamp 302000764.
6. Insert the test lamp 302000765 in the socket.
7. Apply line voltage and set the switch to “Auto”.
   Visual check:
   Green LEDs (D2 and D7) illuminate.
   Red LED (D3) flashes.
   Check soft start:
   The motor lamp slowly starts to illuminate (soft start).

Continued on page 42

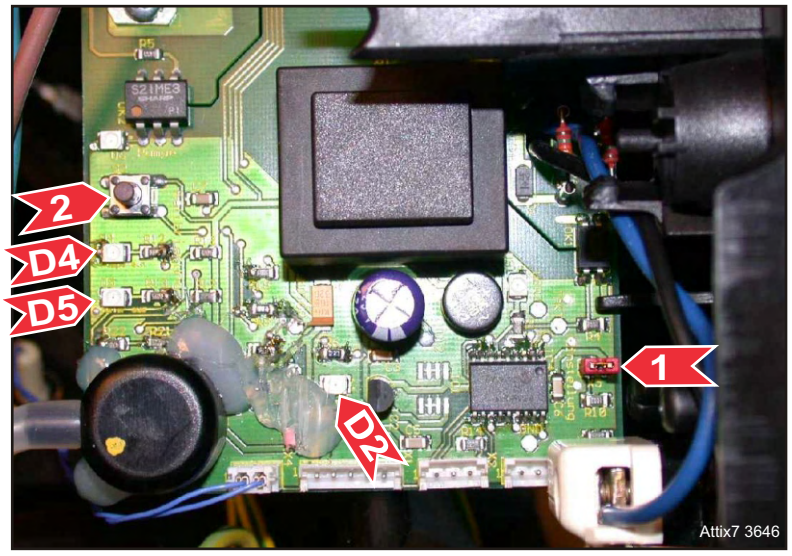
Check level control:
Mark the hose at 7 and 11 cm (see 7.11, page 40).
Slowly immerse the hose in a container filled with water until the lamp illuminates. This turn-on point should be at the marking 7 cm ±1 cm (recalibrate the level control if necessary (see 7.13, page 40) and repeat the procedure).
Green LEDs (D7, D2 and D6) illuminate.
Red LED (D3) flashes (microprocessor working).
Yellow LED (D4) illuminates (level - pump on).
Continue to immerse the hose in water until the check lamp (motor) extinguishes. This turn-off point should be at the marking 11 cm ±1 cm.
Green LEDs (D2 and D6) illuminate.
Red LED (D3) flashes.
Yellow LED (D4) illuminates.
Red LED (D5) illuminates.

8. Take the hose out of the water.
Visual check:
The check lamp (motor) illuminates after about 6 s.
Green LEDs (D2, D7 and D6) illuminate.
Yellow LED (D4) illuminates.
Red LED (D3) flashes.
After another 20-25 s the check lamp (pump) and LEDs (D4 and D6) extinguish.

9. Check pump mode:
Set the switch to “Pump” and hold it there.
The motor lamp extinguishes.
The pump lamp illuminates.
Green LEDs (D2 and D6) illuminate.
Red LED (D3) flashes.
Red LED (D5) illuminates.
Yellow LED (D4) illuminates.
After about 60 s the check lamp (pump) and LEDs (D6 and D3) extinguish.
Briefly set the switch to “Pump” (it should automatically return to “Auto”).
The motor lamp and pump lamp illuminate.
Green LEDs (D2, D6 and D7) illuminate.
Red LED (D3) flashes.
Yellow LED (D4) illuminates.
After about 30 s the lamp (pump) and LEDs (D4 and D6) extinguish.

“Automatic” OK?
- Yes - “Auto” Mode OK.
- No - Replace electronic and recalibrate level

7.13 Calibrating electronic level control (Attix 751-61/-71, 19 Gallon/AE)



1. Make sure the unit is isolated from the power supply.
2. Remove the hood (see 4.4, page 30).
3. Place the cleaner head on a table so that the hose hangs downwards.
4. Mark the hose at 7 cm (see 7.11, page 40).
5. Place the jumper (53840) on X5 (1).
6. Apply line voltage and set the switch to “I”.
   Visual check:
   Green LED (D2) illuminates.
   Yellow LED (D4) and red LED (D5) flash.
7. Immerse the hose up to the marking in water, and press the calibration button (2) with an insulated tip. During calibration the LEDs (D4 and D5) will illuminate (about 2-3 s). After calibration they extinguish.
8. Remove the jumper from X5 (1), and check the level control after resetting with the switch.

7.14 Removing/fitting electronic level control (Attix 751-61/-71, 19 Gallon/AE)

1. Remove the hood (see 4.4).
2. Withdraw the connections of the power line, motor and temperature sensor from the electronics. Disconnect L1 and N on the socket. Take the two hoses off the pressure sensor.
3. Undo the retaining screw on the rotary knob with a Phillips screwdriver, and remove the rotary knob (see 7.10).
4. Undo the two retaining screws behind the rotary knob with a Phillips screwdriver, and remove the electronics (see 7.10).
5. Fit in the reverse order.

The following repairs are identical as with other models.

	Attix	751-61/-71, 19 Gallon AE	751-61/-71, 19 Gallon AE, 751-2M/-0H, 763-2MED 791-2M/B1	Identical to Attix	See section "Troubleshooting" in repair manual
7.15	**Checking temperature sensor**	X		Centix	Attix 350/360/Centix page 48
7.16	**Removing / fitting temperature sensor / flow sensor**		X	550-2M/-0H Centix	Attix 350/360/Centix page 48

	Attix	751-01/-11 19 Gallon	751-21	751-2M/-0H	Identical to Attix	See section "Troubleshooting" in repair manual
7.17	**Checking removing / fitting electronic soft start**	X			550-01 12 Gallon	Attix 550/560 page 47-48
7.18	**Checking removing / fitting electronic EA.**		X		550-21	Attix 550/560 page 49-51
7.19	**Checking removing / fitting electronic flow metering**			X	550-0H/-2M	Attix 550/560 page 52-57

	Attix	761-21XC 763-21ED 19 Gal. AS/PE2	761-21XC/-2MXC 763-21ED/-2MED 19 Gal. AS/PE2	Identical to Attix	See section "Troubleshooting" in repair manual
7.20	**Checking removing / fitting electronic magnet control**	X		560-21 12 Gallon RDFD	Attix 550/560 /Seite 60-63
7.21	**Checking level monitoring**		X	560-21 12 Gallon RDFD	Attix 550/560 /Seite 63-64

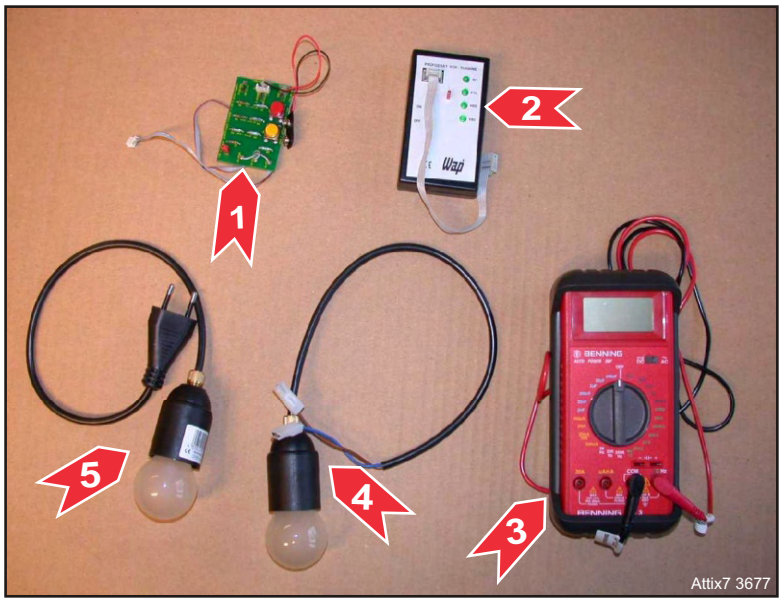
The following repairs are identical as with other models.

	Attix	761-2MXC 763-2MED	751-2M 761-2MXC 763-2MED 791-2M/B1	751-2M/-0H 761-2MXC 763-2MED 791-2M/B1	Identical to Attix	See section "Troubleshooting" in repair manual
7.22	**Checking / removing electronic flow sensor XC**	X			560-2MXC	Attix 550/560 /Seite 66-68
7.23	**Electronic potentiometer (hose diameter)**		X		560-21 12 Gallon RDFD	Attix 550/560 /Seite 69-70
7.24	**Checking piezo buzzer**			X	560-2MXC	Attix 550/560 /Seite 71

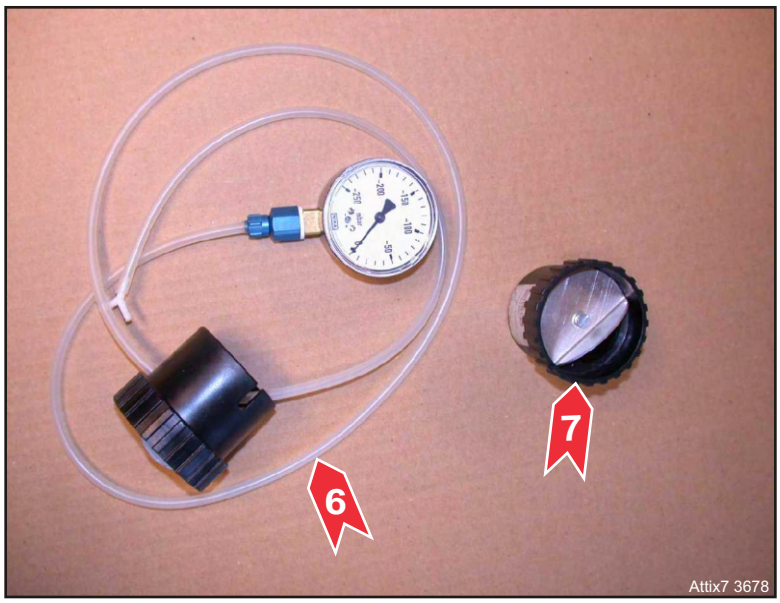
	Attix	791-21	791-21 791-2M/B1	Identical to Attix	See section "Troubleshooting" in repair manual
7.25	**Removing / fitting electronic EA. EC-3**	X		590-21	Attix 590-21 /Seite 22-24
7.26	**Checking removing / fitting electronic EC-3**		X	590-21	Attix 590-21 /Seite 25-26
7.27	**Checking, removing / fitting RFI filter / varistor**		X	590-21	Attix 590-21 /Seite 26-27

Please use the current spare parts list.

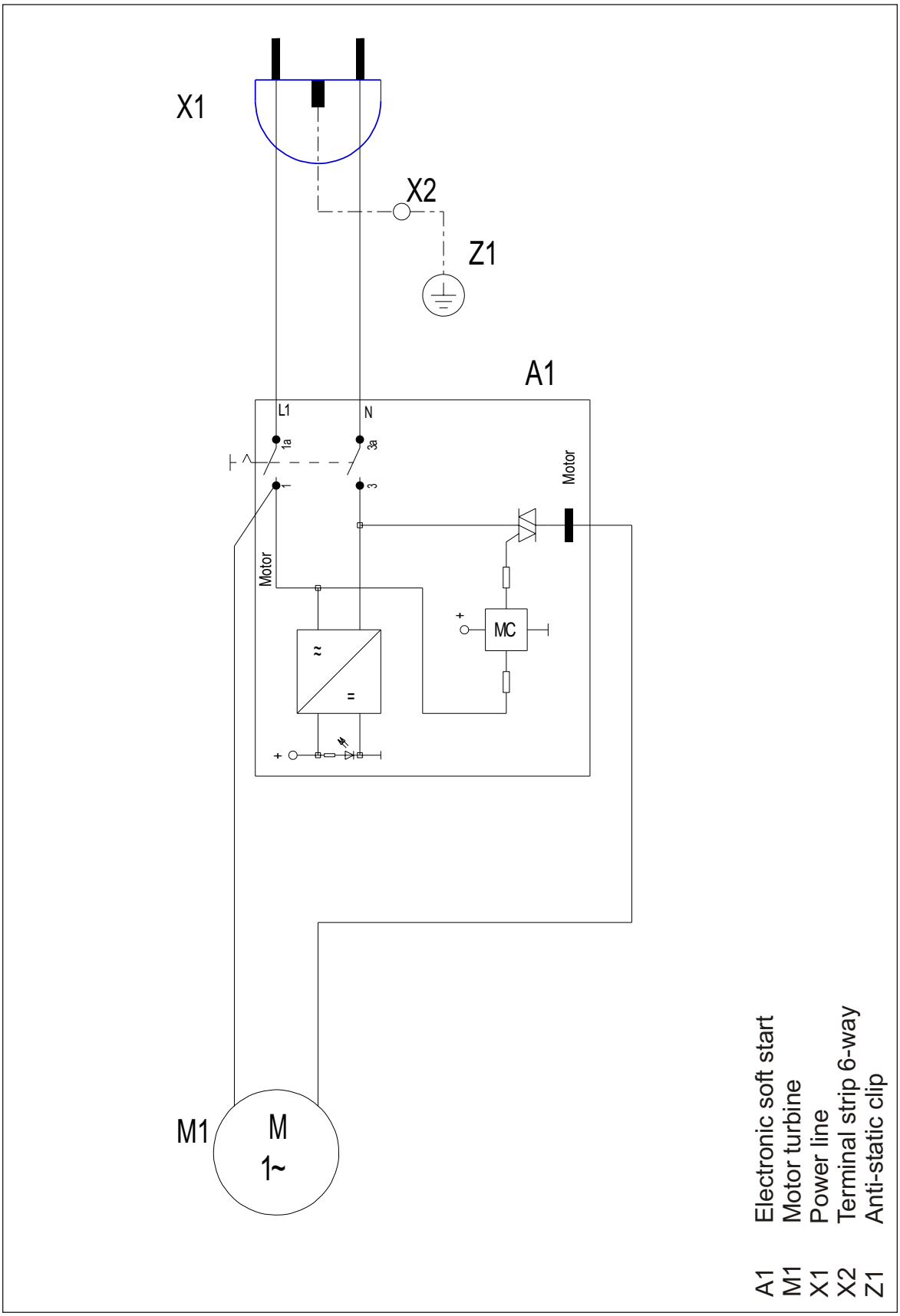
1 Special-purpose tools



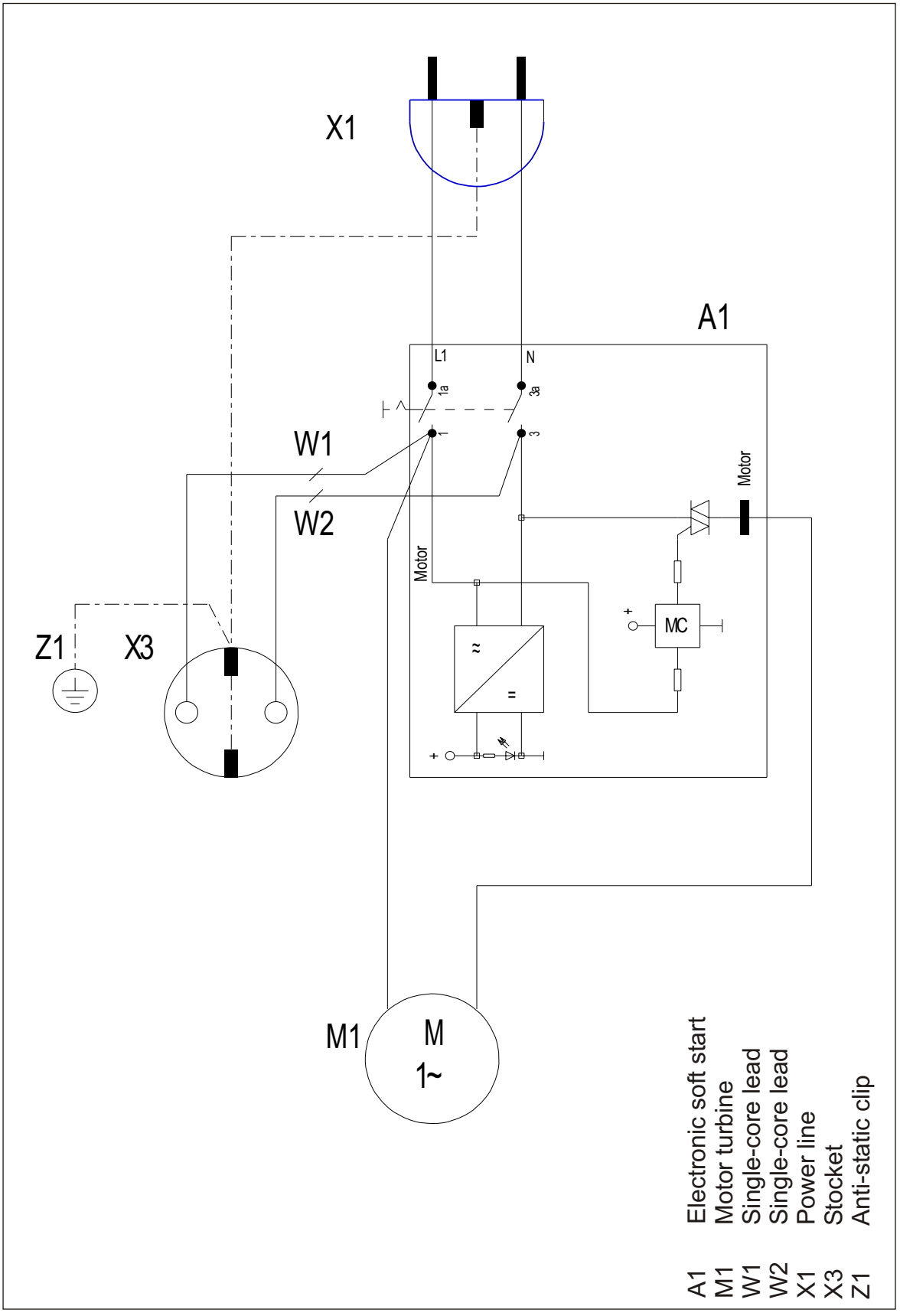
1. Calibration sensor (Alto no. 302000766)
2. Electronic device to check EC turbine (Alto no. 62859)
3. Digital multimeter
4. Lamp holder E-27/40 W (Alto no. 302000764)
5. Lamp holder E-27/40 W (Alto no. 302000765)
6. Test device (Alto no. 40434)
7. Adjustment mask (Alto no. 62480)



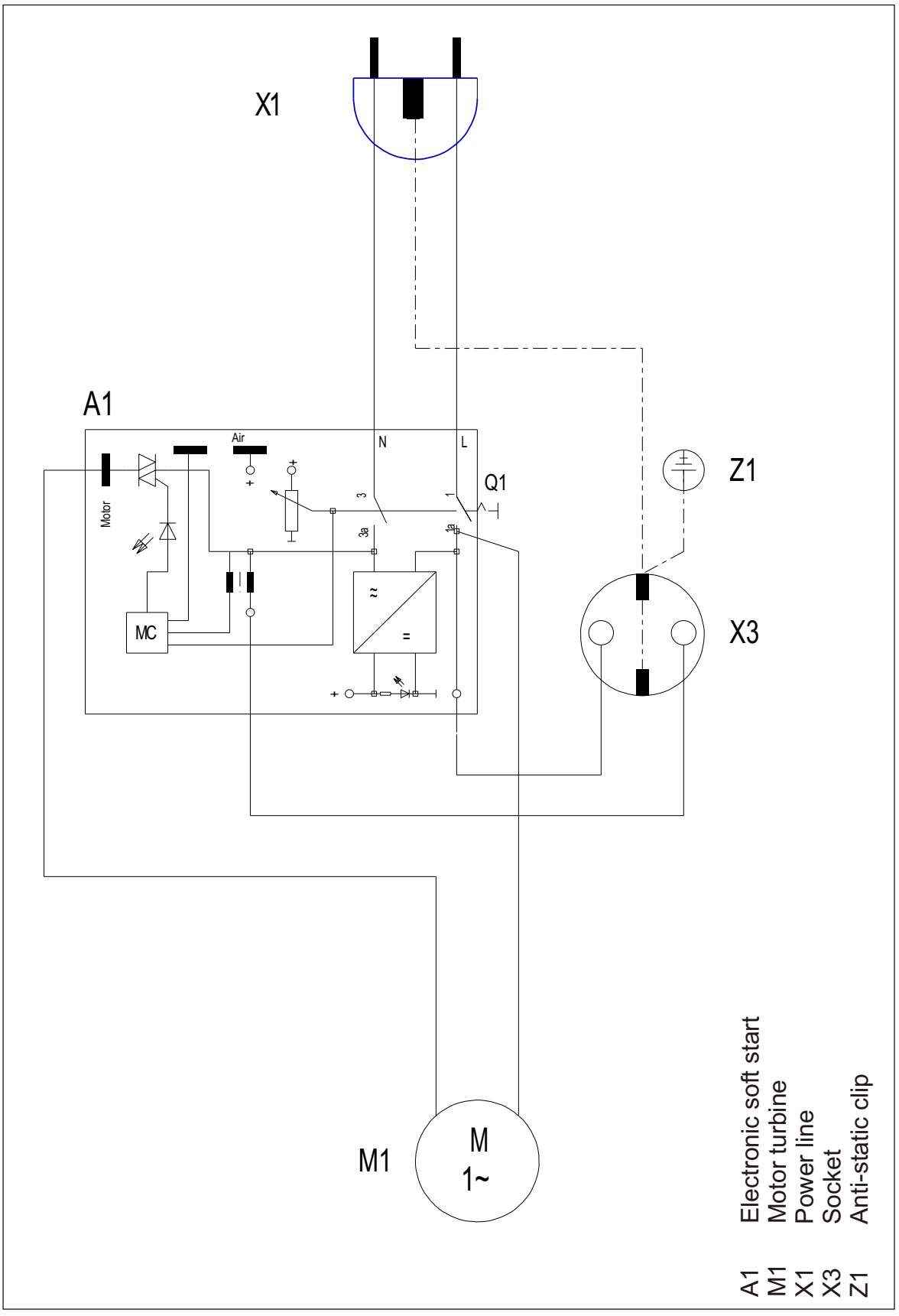
1 Wiring diagram of Attix 751-01



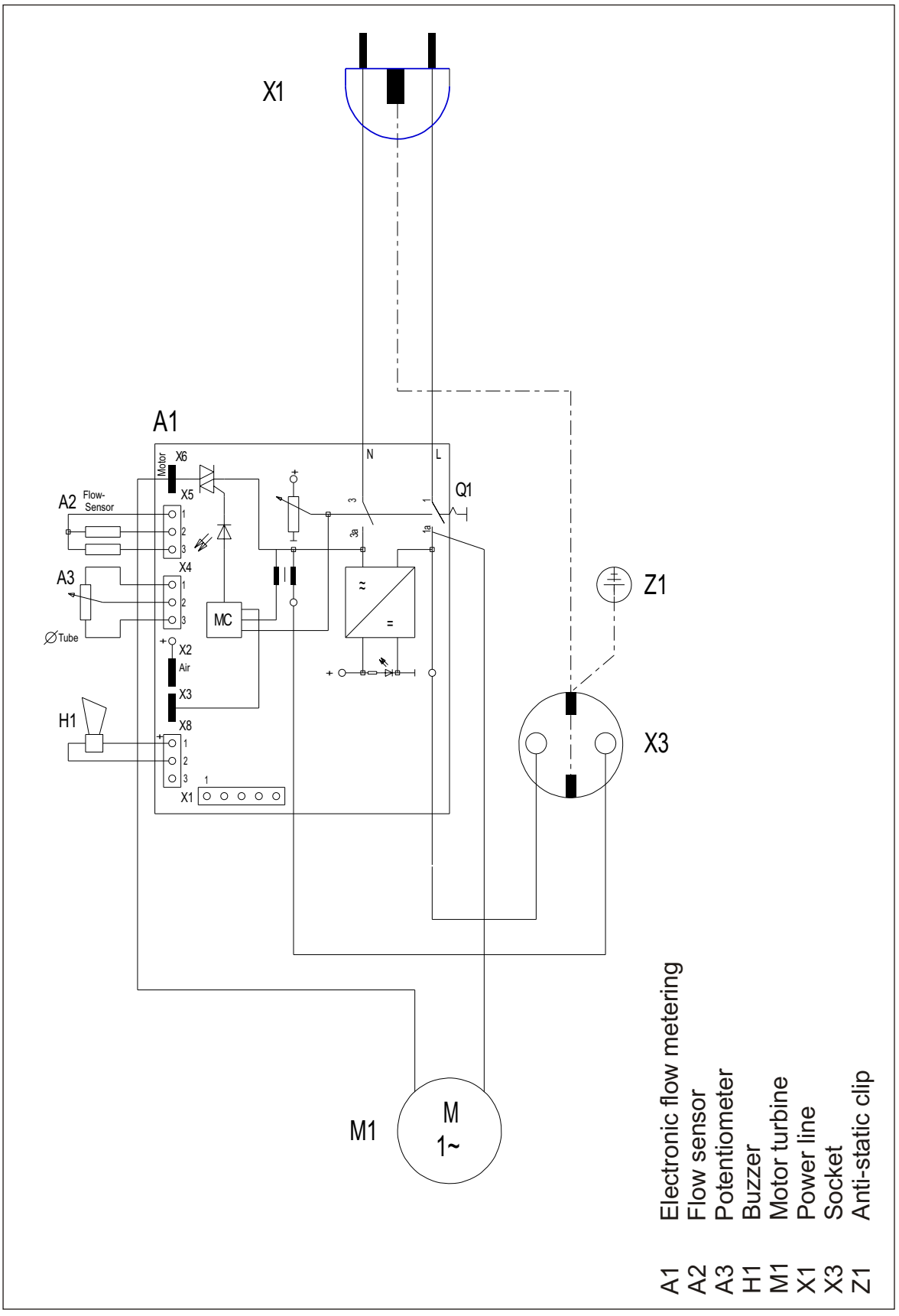
2 Wiring diagram of Attix 751-11, Attix 19 Gallon



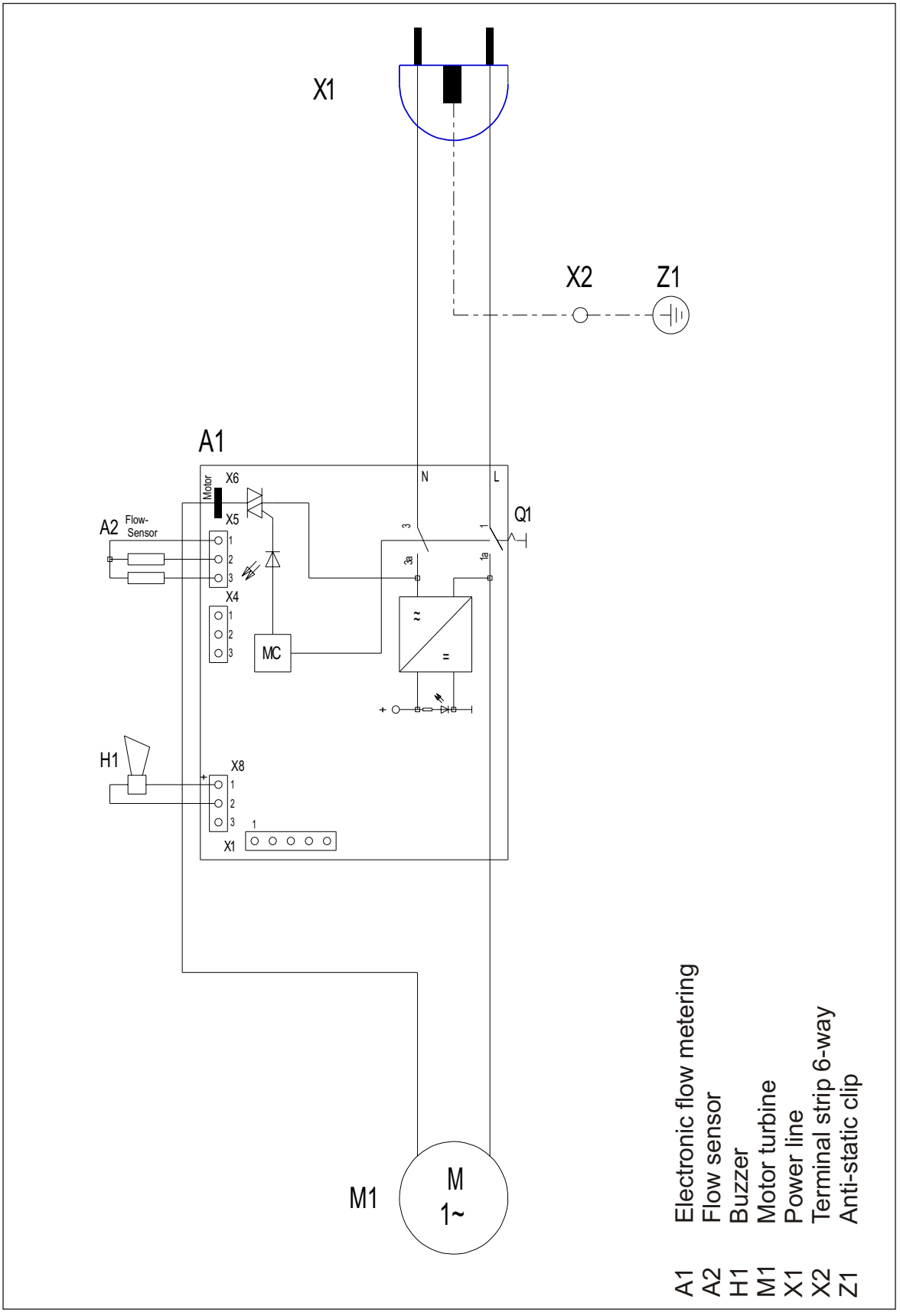
3 Wiring diagram of Attix 751-21



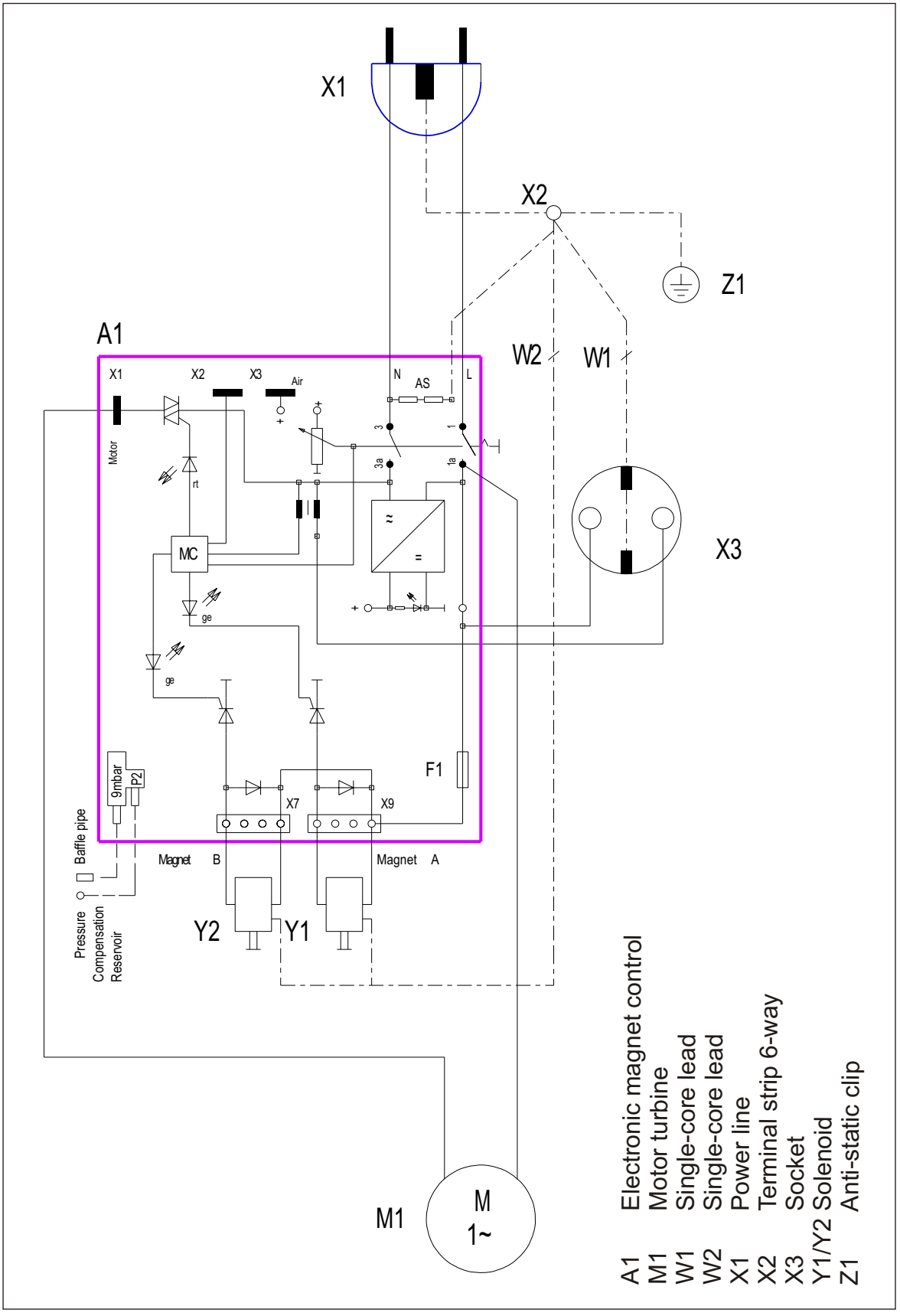
4 Wiring diagram of Attix 751-2M



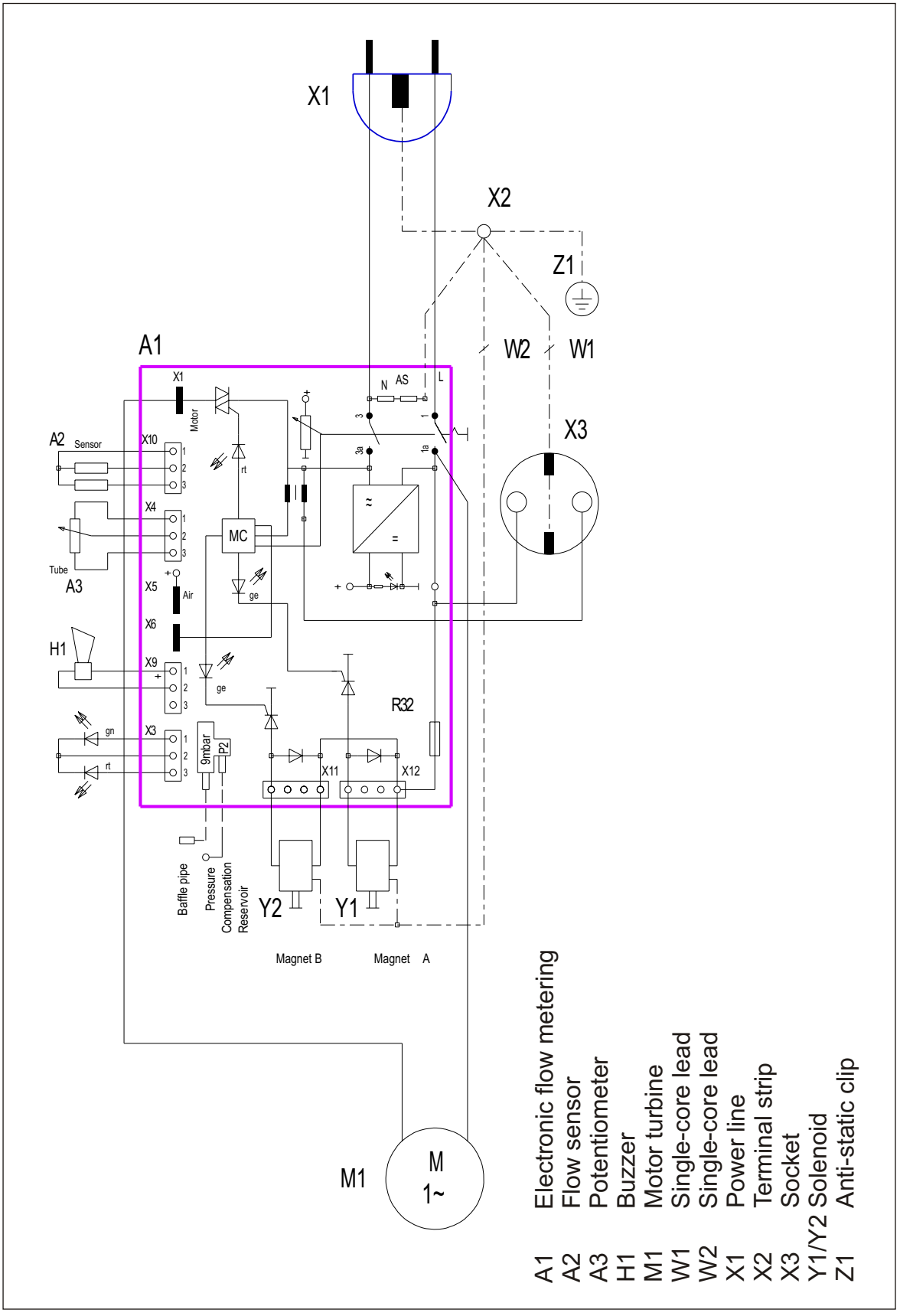
5 Wiring diagram of Attix 751-0H



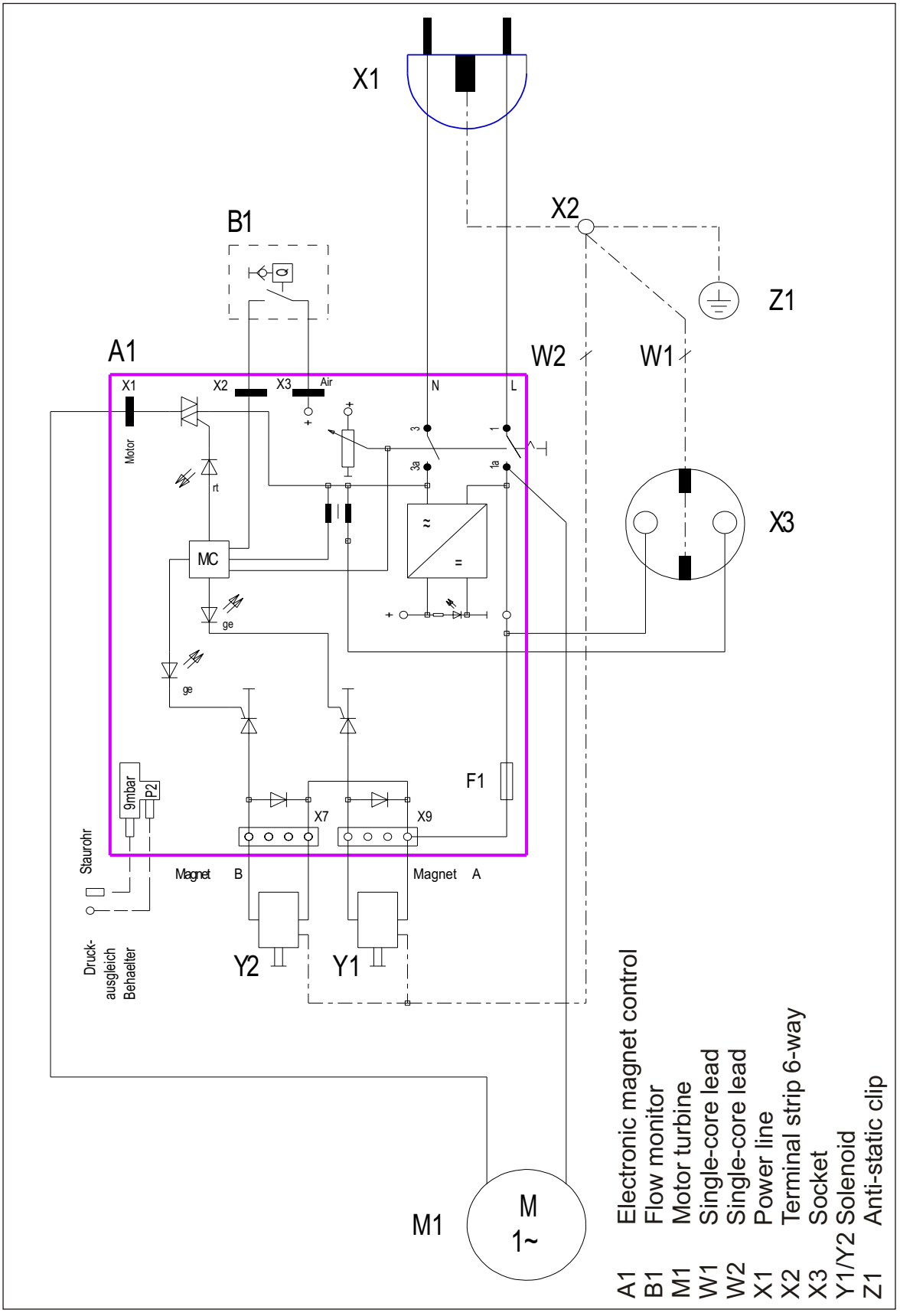
6 Wiring diagram of Attix 761-21XC, Attix 763-21ED



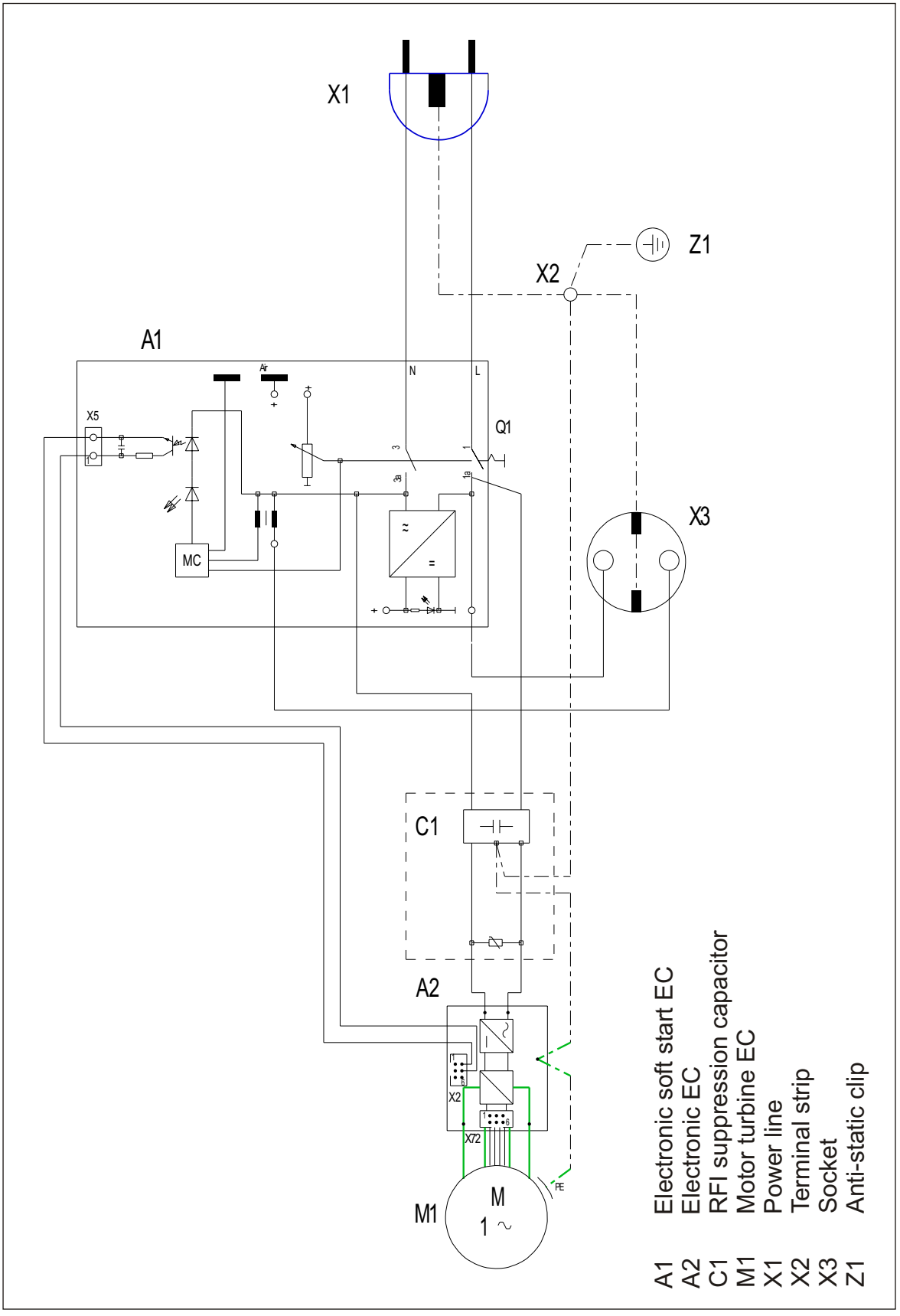
7 Wiring diagram of Attix 761-2MXC, Attix 763-2MED



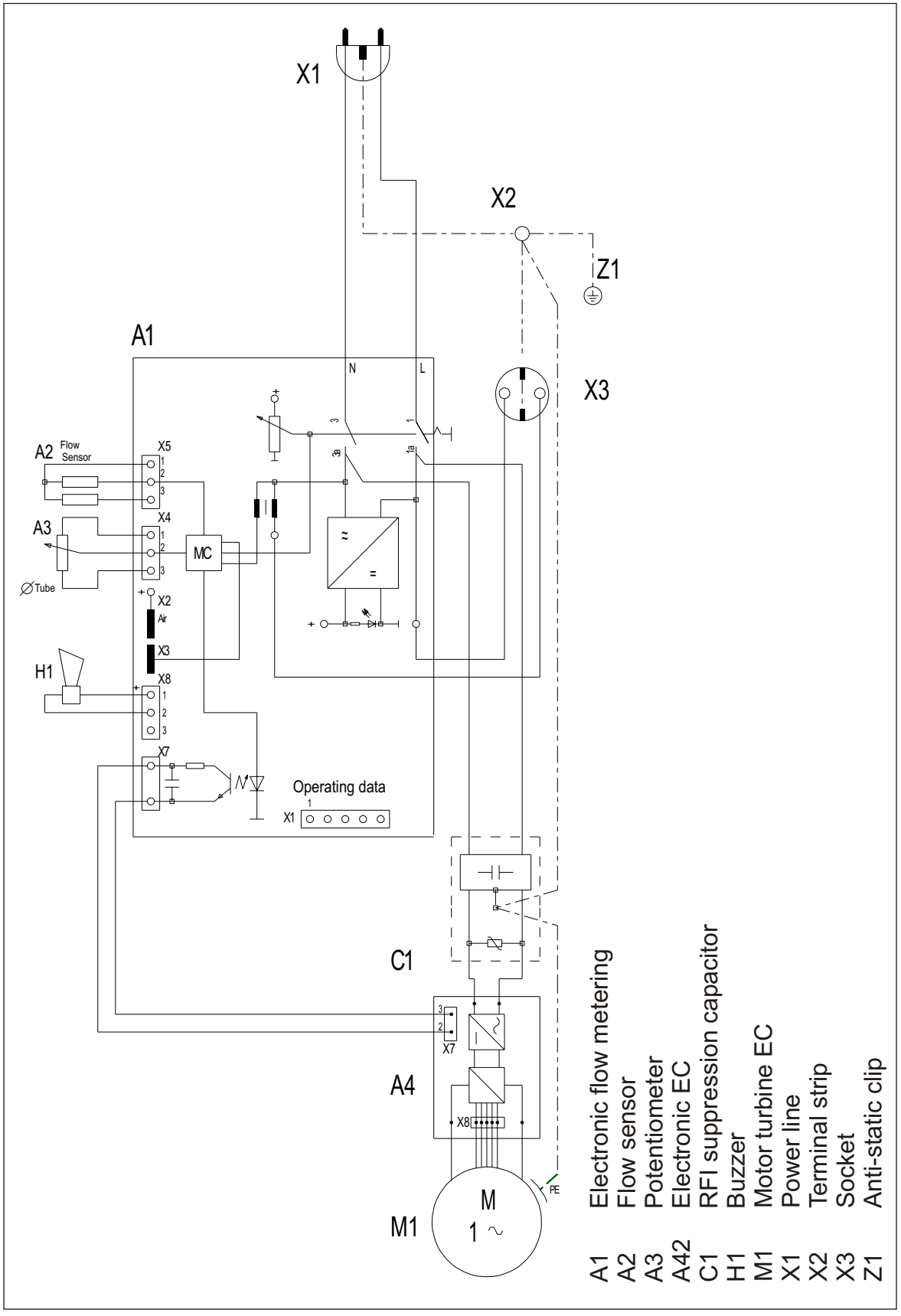
12 Wiring diagram of Attix 19 Gallon AS/PE 2



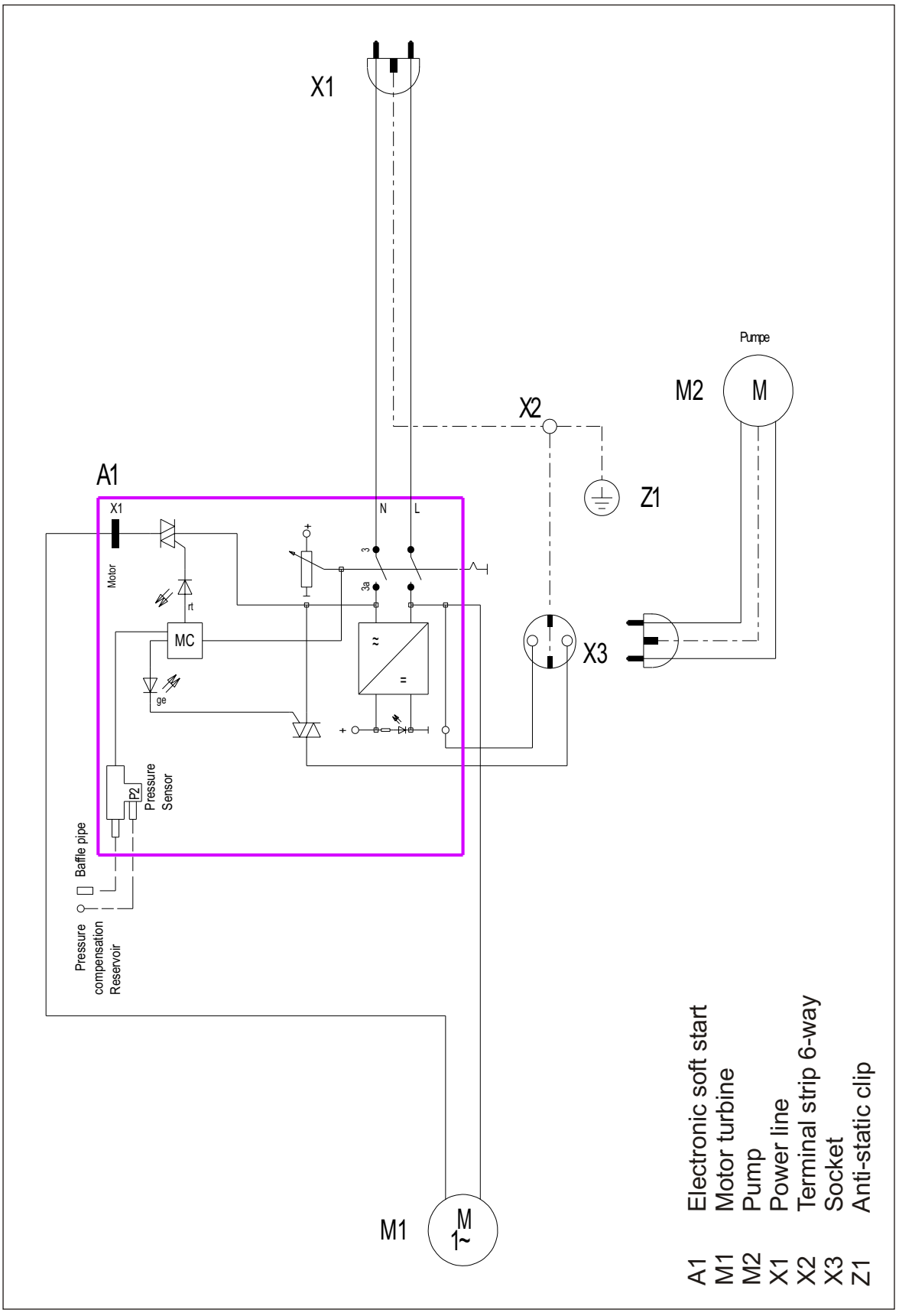
8 Wiring diagram of Attix 791-21



9 Wiring diagram of Attix 791-2M/B1



10 Wiring diagram of Attix 751-61, Attix 19 Gallon AE



11 Wiring diagram of Attix 751-71